PORTLAND HARBOR RI/FS

STORMWATER LOADING CALCULATION METHODS

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Recommended for Inclusion in Administrative Record

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AFT	Abiotic Fate and Transport Model
AOPC	Area of Potential Concern
BSAF	biota sediment accumulation factor
COV	coefficient of variation
DEQ	Oregon Department of Environmental Quality
EDD	Electronic Data Deliverables
EPA	U.S. Environmental Protection Agency
EQuIS	Environmental Quality Information System
FSP	Field Sampling Plan
FSR	Field Sampling Report
FWM	Food Web Model
GOF	goodness-of-fit
HST	Hydrodynamic and Sediment Transport Model
LCL	Lower Confidence Limit
LPL	Lower Prediction Limit
LWG	Lower Willamette Group
OC	organic carbon
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PRE	proportional reduction in error
PRG	Preliminary Remediation Goals
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RI/FS	Remedial Investigation/Feasibility Study
ROS	regression on order statistics
SCRA	Site Characterization and Risk Assessment
SDG	sample delivery group
Site	Portland Harbor Superfund Site
SSR	Stormwater Sampling Rationale
SVOC	semivolatile organic compound
TOC	total organic carbon
TSS	total suspended solids
UCL	Upper Confidence Limit
UPL	Upper Prediction Limit
WMW	Wilcoxon-Mann-Whitney

1.0 Introduction

This document presents the methods for conducting stormwater loading estimate calculations using stormwater and sediment trap data collected as part of the Remedial Investigation and Feasibility Study (RI/FS) of the Portland Harbor Superfund Site (Site). This data was collected in accordance with the Round 3A Stormwater Field Sampling Plan and Addendum (FSP; Anchor and Integral 2007a and c) and its companion document, the Round 3A Stormwater Sampling Rationale (SSR) (Anchor and Integral 2007b) and analyzed in accordance with the Quality Assurance Project Plan Addendum 8 (QAPP Addendum 8, Integral 2007). The field sampling activities are described in detail in the Round 3A Upland Stormwater Sampling Field Sampling Report (FSR; Anchor and Integral 2007d) and the FSR Addendum (Anchor and Integral 2008 in prep). Data were collected during a total of 15 storm events, with each outfall sampled an average of three times and each sediment trap collecting sediment for a duration varying between three and seven months during two separate sampling periods. Due to the limited time span of sampling and the known variability of stormwater, this data should be considered to represent a "snap shot" of stormwater entering the Portland Harbor Superfund Site during the sampling period.

1.1 BACKGROUND AND CONTEXT

In November 2006, the U.S. Environmental Protection Agency (EPA) and Lower Willamette Group (LWG) determined that stormwater data were needed to complete the RI and FS, and that such data would need to be collected in the 2006/2007 wet-weather season to fit within the overall RI/FS project schedule. They convened a Stormwater Technical Team, which included representatives from EPA, Oregon Department of Environmental Quality (DEQ), and LWG, to develop the framework for a sampling plan. The sampling framework described in the FSP was developed by the Stormwater Technical Team and is based on an EPA memorandum dated December 13, 2006 (Koch et al. 2006). This framework was discussed and approved by Portland Harbor managers from EPA, DEQ, the Tribes, and LWG on December 20, 2006.

The Stormwater Technical Team evaluated a range of stormwater data collection technical approaches and selected those described in the framework and elaborated in the SSR, based on 1) the ability to meet the objectives for data use (see Section 2.1) as agreed to by the Portland Harbor managers; and 2) practicability in terms of schedule, cost, and feasibility.

The sampling framework was initially designed to complete stormwater data collection by the end of the 2006/2007 wet-weather season (i.e., May/June 2007). The Stormwater Technical Team reviewed sample completeness information after the end of the 2006/2007 season (first round) and identified several substantial data needs to meet the originally intended FSP and SSR objectives. A second round of sampling was conducted in the late portion of 2007 and the early portion of 2008 (per the FSP

Addendum) in order to collect as much data as possible while still staying within the constraints of the RI/FS schedule. Per the EPA letter dated March 24, 2008 and its attached table (included in Appendix B), it was determined that the data collection activities associated with the FSP Addendum have been completed and there are no remaining stormwater data gaps for the purposes of the RI/FS.

1.2 PURPOSE OF DOCUMENT

The purpose of this document is to outline the framework for analyzing the stormwater and sediment trap data and calculating stormwater loads to the Site using estimation tools and models as discussed in Section 2.2.

To demonstrate the data analysis methods more clearly, a preliminary data analysis trial was conducted using a small subset of ten analytes from the composite stormwater data collected during the first round of stormwater sampling including Port of Portland data collected during the same time period. The results of this data analysis are contained in Appendix A for reference, and examples are shown in the text to illustrate the proposed methods.

The final data analysis will be completed after all stormwater data have been validated and will employ the methods presented in this report or as modified by EPA and LWG agreement based on EPA's review of this report.

2.0 Objective of Loading Evaluation

The objective of the loading evaluation is to provide data to support the risk evaluation and for evaluating potential sediment recontamination from stormwater discharges to the river. These stormwater loading evaluation results will be input into estimation tools and models (discussed in Section 2.2) to further develop the understanding of the relative magnitude of stormwater impacts to the Site. The results will be presented in the RI and discussed in the context of sources, loading, and fate and transport. This information will ultimately support the evaluation of remedial alternatives in the Site FS.

2.1 RI/FS STORMWATER SAMPLING OBJECTIVES

The objectives of the RI/FS stormwater sampling program as discussed by the Stormwater Technical Team and accepted by EPA are to:

- Understand stormwater contribution to in-river fish tissue chemical burdens.
- Determine the potential for recontamination of sediment (after cleanup) from stormwater inputs.

2.1.1 Stormwater Contribution to Fish Tissue Burdens

Surface water chemicals have the potential to contribute to fish tissue burdens (and related risks) at the Site. The relative importance of various sources of surface water chemicals, particularly stormwater, is not well understood. The sources to the water column from resuspension of sediment versus other waterborne sources (such as stormwater and upstream contributions) are needed to develop sediment preliminary remediation goals (PRGs) that are protective to fish and of human exposure to fish tissue.

Thus, it is necessary to determine the relative contribution of stormwater (as compared to other sources) to surface water concentrations of selected chemicals at the Site. For stormwater, this would be done in terms of loading estimates. To understand the relative contribution of stormwater chemicals to fish tissue burdens, other sources of chemicals also need to be understood. Other potential sources to the water column and fish tissue that have been investigated by the LWG are contributions from upstream surface water, direct atmospheric deposition to the river, over-water discharge, in-river sediments, river bank erosion, and groundwater discharge to the river. Additionally, it is important that the in-river modeling tools used (discussed in Section 2.2.) for the site accurately predict contribution from the water column relative to other potential sources of tissue chemical burdens.

2.1.2 Stormwater Contribution to Recontamination Potential

Stormwater discharges have the potential to contribute to recontamination of sediments near outfalls (and potentially Site-wide for some chemicals) after cleanup has been completed if the discharges contain chemicals attached to settling solids. The recontamination potential for this outcome will be assessed at an FS-appropriate level[1] of detail to understand the general extent and need for source controls that will minimize the potential for recontamination of the appropriate sediment cleanup remedies determined in the FS.

To predict whether remediated sediments would recontaminate to levels above the cleanup levels that will eventually be set for the Site, estimates of stormwater loads are needed for input into estimation tools and models described in Section 2.2. These stormwater loading estimates must be on a spatial scale consistent with those estimation tools and models.

2.2 RI/FS USES OF STORMWATER DATA

Several evaluation and modeling tools will use the stormwater loading estimates to meet the above objectives. One of these tools is described in the *Draft Chemical Fate and Transport Model Development and Data Gaps Identification Report* (Anchor et al. 2007). The fate and transport model includes three independent models collectively known as the "Hybrid Model:"

- Hydrodynamic and Sediment Transport (HST) Model: This model has been developed by the LWG to describe the movement of water and sediments around the Site. This model has been developed in several phases during the project and is most recently described in WEST Consultants (2006).
- The chemical Abiotic Fate and Transport (AFT) Model: This model was originally developed by EPA in coordination with DEQ to describe chemical movement and distribution within abiotic environmental media at the Site (Hope 2006).
- Food Web Model (FWM): This model has been developed by Windward Environmental for the LWG in collaboration with EPA and partner agencies to describe the movement of chemicals from water and sediment into biota and through the aquatic food web (Integral et al. 2007).

The Hybrid Model requires estimates of the chemical mass load (e.g., kilograms per month) from each type of chemical source (e.g., stormwater, groundwater, upstream,

[1] FS-level of detail refers to the fact that the FS will address issues at the level of detail needed to select preferred remedial alternatives. This is opposed to, for example, a design level of detail, which may require smaller scale, greater frequency, or other types of more detailed information.

etc.) for each of the model-defined cells of the river. This report will present the methods for estimating these loads for stormwater.

The model will be run first to support the source, fate, and transport evaluation in the RI. The RI will also contain a separate empirical evaluation of source, fate, and transport that will rely directly on the stormwater data and loading estimates without intermediary use of the Hybrid Model.

As noted above, the initial model runs (including stormwater loading estimates) will also be used to help set sediment PRGs, which is currently expected to occur simultaneously with the writing of the RI. It is the current LWG proposal that the PRGs will be presented in the first FS related deliverable, the Alternatives Development and Screening Report. EPA has commented that they wish to see PRGs presented in an earlier separate document, and the FS documentation process is currently under negotiation.

Finally, additional runs of the Hybrid Model (including stormwater loading estimates) will be used in the FS to understand the potential for recontamination and evaluate the long-term outcome of various sediment remediation alternatives evaluated in the FS.

The stormwater loading estimates developed using the methods described in this report are not in any way intended for use in evaluating stormwater source controls at individual upland sites.

3.0 Chemical Lists for Stormwater Loading Estimates

Before stormwater loading estimates can be made, the list of chemicals relevant to those estimates must be developed. Different chemical lists will be defined for the various RI/FS purposes of:

- RI empirical source, fate, and transport evaluations[2]
- RI Hybrid Model runs
- FS Hybrid Model runs for PRG development
- FS Hybrid Model runs for recontamination and long-term alternatives evaluation.

These chemical lists are currently being discussed with EPA and will be determined in coordination with EPA. Consequently, this section does not attempt to define these lists, but instead, discusses the data available, the chemical lists preliminarily evaluated for this report, and the general issues that should be addressed for future chemical list development.

3.1 SAMPLED CHEMICALS

The priority order and list of chemicals analyzed was presented in the FSP and varies somewhat for each sampling type among locations. The list of chemicals analyzed at each sampling location is shown in Table 3-1. Chemical names and their coded equivalent are included in Table 3-2. Table 3-1 includes seven sampling locations associated with the Port of Portland's Terminal 4 recontamination study. As discussed in the SSR, the overall sampling approach for the Terminal 4 sampling is similar to that described in the FSP, and the data generated will be used consistently with those generated at other locations. Additionally, the priority of analytes for sediment traps was changed in some cases per decisions made by the Stormwater Technical Team and EPA due to limited sample volume, and the data presented in Table 3-1 reflects those changes. The rationale for variation in chemical lists for sampling locations and the rationale for other specific methods for each sample type is described in the SSR and FSR.

3.2 CHEMICALS FOR PRELIMINARY DATA ANALYSIS

As described previously, to explore the potential loading estimate methods, preliminary data analyses using the first round stormwater data were conducted for this report. The data used for this preliminary data analysis included first round composite stormwater data collected by LWG as well as data collected by the Port of Portland from March

[2] Similar to the Round 2 Report, the RI will contain a section that describes the loading, fate, and transport of chemicals around the Site based on the empirical date collected in Rounds 1 through 3 of project sampling. This section will not rely on Hybrid Modeling estimates of long term fate and transport processes, although it will compare and contrast with findings of the modeling efforts.

through June of 2007. The Stormwater Technical Team chose a list of ten analytes for the preliminary data analysis. This list includes:

- Five polychlorinated biphenyl (PCB) congeners
  - PCB 18
  - PCB 66
  - PCB 118/106 coelution
  - PCB 153
  - PCB 194
- Two polycyclic aromatic hydrocarbons (PAHs)
  - Benzo(a)pyrene
  - Acenaphthene
- Arsenic
- Lead
- Total suspended solids (TSS)

This list was selected primarily to include bioaccumulative compounds that are known to be a risk drivers at the Site (PCBs), some representative PAHs that are widespread throughout the harbor, and two representative metals. DDx compounds, phthalates, and herbicides were not selected for this preliminary analysis because stormwater data are available for these compounds from only select sites and/or a limited number of storm events[3]. Examples of the results of this preliminary data analysis using data from the first round of stormwater sampling are presented in this report, and the full results are presented in Appendix A.

3.3 CHEMICAL LISTS FOR RI/FS PURPOSES

Future stormwater loading estimates using the entire data set will be used for the four primary purposes noted in Section 3.0. For the RI, LWG and EPA will develop a draft list of "indicator" chemicals that will be used in all or most RI presentations of nature and extent of chemical distributions. As discussed recently with EPA, it is expected that a target list of chemicals will be identified from this media-specific list of RI indicator chemicals for development of empirical source, fate, and transport evaluations. The draft list of target chemicals for stormwater loading calculations to be presented in the RI consists of the combined indicator chemical lists for sediment, surface water, and biota. Additionally, this list will be inclusive of all analytes to be run by the Hybrid Model (discussed below). Availability of data to complete calculations for this entire target list may further limit the analyte list for stormwater loading.

Because of the logistical difficulty of running numerous chemicals through the Hybrid Model, the RI empirical loading, fate, and transport evaluation list will need to be further reduced to a list of chemicals for use in the model runs for the RI. Consideration

[3] Note that these compounds will be addressed primarily through sediment trap data as detailed later in this document. Sediment trap data were not the subject of the exploratory analyses requested by the Stormwater Technical Team.

will be given to include primary risk drivers, as well as select chemicals of other types, which cross a range of geochemical behavioral characteristics. Again, this list will be developed by LWG in coordination with EPA.

The list of chemicals to be modeled for early PRG development to start the FS will need to be representative of those risk driver chemicals that LWG and EPA agree upon for early PRG development. The current concept is to identify a small subset of risk drivers that are likely to be the primary factors determining the spatial extent of Areas of Potential Concern (AOPCs) for the FS due to the unacceptable potential risk they pose at low levels and their widespread distribution around the Site. Further, because the purpose of this evaluation is to calculate sediment PRGs using the steady state FWM and that account for contributions of sediment chemical mass to the water column, only those chemicals that can be addressed by the FWM can be included in this list of chemicals. For example, chemical drivers that will have PRGs developed through Biota Sediment Accumulation Factors (BSAFs) will not need to be included in the list for Hybrid Model runs for PRG development.

Finally, the chemical list for FS recontamination and long-term alternative evaluation modeling will also need to be selected to represent the risk drivers and the range of chemicals presenting risk at the Site. This list would likely be similar to either the RI modeling and/or PRG modeling chemical lists. However, because the results of the Baseline Risk Assessment will be known at the time this FS evaluation starts, the previous lists will need to be updated to most closely represent the findings of the Baseline Risk Assessment.

In summary, progressively smaller lists of chemicals will be developed for stormwater loading estimates as follows:

- RI empirical loading, fate, and transport evaluations – largest list
- RI Hybrid Model runs – smaller list
- FS Hybrid Model runs for PRG development – smallest list
- FS Hybrid Model runs for recontamination and long-term alternatives evaluation – smaller list

Given that the largest list will be for the RI empirical evaluation, which will come earliest in the process, this will define the initial list of all chemicals for which stormwater loading estimates will need to be defined. However, given the factors leading to the later and smaller lists (e.g., inclusion of results of the Baseline Risk Assessment), it is possible that stormwater loading estimates for some additional chemicals not captured in the initial list for the RI may need to be developed later in the RI/FS process.

4.0 Overall Loading Methods

In general, to estimate stormwater loads, a chemical concentration in stormwater and the volume of stormwater discharge (i.e., time-integrated flows) must be known. These terms can be either directly measured or estimated through indirect means (e.g., runoff modeling of stormwater volumes).

As stated above, the purpose of the RI/FS stormwater sampling effort was to provide data for evaluating the potential risk and sediment recontamination from stormwater discharges to the river. Because the scope of this data collection effort was to provide sufficient data for an RI/FS-level evaluation of stormwater loads and contributions to potential in-river risk and recontamination issues for the Site, it was not necessary to collect direct measurements from every stormwater discharge to the Site. Direct measurements of stormwater loads would require an unreasonably large number of samples for the Harbor-wide assessment because of the number of outfalls present as well as the variability of land uses, site conditions and drainage characteristics. .

Instead, the stormwater sampling location rationale was designed using a commonly used approach of applying "Representative" estimates of stormwater chemical concentrations for various land use types (Scheuler 1987). A land-use-based chemical load modeling approach will be used to estimate loads across the entire Site. Chemical loading models use site characteristics (e.g., land use and percent impervious area) and land-use-specific loading rates to estimate overall loading into the receiving waters. This approach has been modified to better fit the unique data needs and land use characteristics of the Site, as well as the practical constraints for this sampling effort.

4.1 SAMPLE LOCATION RATIONALE

As explained in the SSR, the entire data set includes three categories of locations to obtain a practicable and sufficient data set from a subset of drainage basins/outfalls within the Site. These locations were sampled by the LWG and Port of Portland (Terminal 4) during two sampling efforts in the spring/summer of 2007 (first round) and the fall/winter of 2007-2008 (second round). One additional site (GE Decommissioning) was sampled by GE, and these results will also be used in the overall LWG stormwater data set. The three categories of locations are:

- **Representative Land Use Locations.** Twelve locations were selected as representative of five of land use (based on zoning) within the overall drainage area. These land use types are as follows[4]:

[4] Note another kind of land use commonly evaluated in stormwater investigations is the "commercial" category, but this is a very minor use (less than 1 percent) within the overall drainage and was judged not to warrant a specific sampling location. Data from the residential land use type will likely be used for commercial land use areas.

- o Residential (two locations) representing less than 25 percent of the overall drainage to the Site
- o Major transportation corridors (three locations, one may be unique as discussed in Section 5.3.2) representing less than 5 percent of the area
- o Heavy industrial (five locations) with total industrial land use (heavy and light)
- o Light industrial (four locations) with total industrial land use (heavy and light)
- o Open space (one location) representing more than 40 percent of the area

- **Specific (Unique) Industrial Locations.** Fifteen industrial locations were selected with unique or unusual potential chemical sources that cannot be easily extrapolated from generalized land use measurements.
- **Multiple Land Use Locations.** Two locations were selected to directly measure stormwater discharge from relatively large basins that have a mixture of land use zones to provide a cross-check with land use loading estimates. Additionally, as discussed in the FSR, during the first round of sampling, the Highway 30 location was inadvertently sampled in a location that included runoff from both highway and industrial areas. The samples from this location will be referred to as Yeon Mixed Use and will also be used as a cross-check for land use loading estimates. (The Highway 30 location was sampled at the correct location during the second round of sampling and is called Highway 30 “A”)

The specific locations sampled within each of these categories are shown in Table 4-1 and Figure 4-1. As discussed in the SSR, the overall sampling approach for the Terminal 4 sampling locations is very similar to that described in the FSP, and the data generated are expected to be consistent with those generated at other locations.

4.2 DATA USE

Stormwater and sediment trap data will be used in different ways depending on which category of location they represent.

4.2.1 Representative Land Use Locations

Chemical concentration data from the first category of locations (representative land use locations) will be pooled by land use type to develop chemical concentrations that are representative of each land use category. These values will be used to estimate loading for other basins with the same land use where site-specific data are not available.[5] For example, stormwater chemical concentrations measured from residential land use basins will be applied to other residential land use basins that were not sampled and converted to extrapolated loads based on the estimated volumes of stormwater discharged from each residential basin within the Site. As discussed in Appendix C, less dense rural residential land uses were included in the Open Space land use category since it was measured as part of the open space location during the RI/FS stormwater sampling. The resulting series of extrapolations will provide total stormwater loads for these land uses across the entire Site drainage for input into the fate and transport model and other estimation tools. An important step in this evaluation (as detailed later) is to examine the results for representative land use heavy industrial sites for potential outliers that indicate the site is indeed unique for one or more chemicals. In this case, the site may be converted to the unique industrial site category for the chemicals in question.

4.2.2 Unique Industrial Sites

Chemical concentration data from the second category of locations (unique industrial sites) may be used in two ways. First, the data will be used to develop loading rates for the specific basin associated with that sampling location or associated site. Appendix C includes a discussion of extrapolating loading rates from individual basins to industrial sites. Second, for locations where the unique chemical character of stormwater only applies to a specific chemical or chemical group, the other chemical concentrations measured at this location might be pooled with the heavy industrial representative land use category data as described above. For example, a metals handling facility may have a unique chemical character for metals, but the other chemicals (e.g., PCBs, semivolatile organic compounds [SVOCs], etc.) may be used in the heavy industrial representative land use data set. Another example is OF-22B, which is a representative land use location for heavy industrial but is expected to be a unique site for pesticides because of historical industrial activities in the area.

The data reduction approach for sampling locations at unique industrial sites is described in Section 5. In general, the data reduction approach for unique industrial sites entails pooling the data for each parameter (TSS, water chemical concentration, and sediment chemical concentration) and analyzing the data for the outliers that indicate the site may be unique for particular chemicals. Any chemicals that are not found to be unique are identified and could possibly be combined with the data from the representative land use locations to generate a representative land use heavy industrial value for use in extrapolation to non-sampled heavy industrial areas. Thus, data collected at the "Unique" industrial sites could be split across unique and heavy industrial representative land use applications depending on the results for each

[5] Because industrial sites are expected to demonstrate a higher degree of variability in contaminant concentrations than other land uses, the list of sampling sites includes a higher proportion of industrial land use sites in an attempt to better capture this variability.

chemical. This process is discussed further in Section 5 and will include professional judgment, such as site knowledge, to determine if the reclassification is warranted.

4.2.3 Basins with Multiple Land Uses

The third category of locations (basins with multiple land uses) will not be used for extrapolated loading estimates because these locations measure a variety of land uses in one sample. These results will be used as an independent verification of extrapolated loads to check against the extrapolated load methods and determine uncertainties in the overall approach.

4.3 ESTIMATION OF LONG-TERM LOADS

Ideally, estimation of long-term loads would involve a large number of water samples taken over the course of many years and many types of storms, pollutant sources, and runoff conditions. However, such an approach is not necessary to meet the objectives for the FSP and would have caused unacceptable schedule delays for the RI/FS. Therefore, both stormwater composite water chemistry samples and sediment trap chemistry samples were collected at the locations listed in Table 4-1 and shown in Figure 4-1. These two measurements provide data to support two independent means of estimating stormwater chemical loads as explained in Sections 4.3.1 and 4.3.2.

It is anticipated that these two methods (composite water and sediment traps) will result in different predictions of mass loading at most locations. The reason for having two independent methods to estimate loads is that each method has intrinsic measurement artifacts that will lead to varying load estimates. The advantages and disadvantages of each method are to some extent complementary. By using two approaches, the disadvantages of each method can be better understood and the two loading estimates provide a better overall sense of the potential range of chemical loads. The advantages and disadvantages of both methods are discussed in the SSR.

It should be noted that loads estimated from the snapshot of stormwater and sediment trap data in this study by definition cannot include any future changes that may occur in the watersheds such as source controls and/or changing land uses over time. Consequently, these future changes must be evaluated on a more general basis using tools that are commonly applied to watersheds in the absence of detailed stormwater chemical data. This will be one subject that will be discussed in more detail in the recontamination analysis that will be undertaken for the FS.

4.3.1 Stormwater Method

For stormwater, chemical concentrations (mass chemical/mass water) are multiplied by the volume of water discharging at the location over a set time to yield a chemical load in mass/time.

4.3.1.1 Runoff Volumes

Runoff volumes will be calculated, using the City of Portland Bureau of Environmental Service's GRID model, for each section of the river as shown in Figure 4-1. Additionally, runoff volumes will be calculated for each location as listed in Table 4-1 as loads to the Site from these locations will be input into the model separately if they are deemed to be unique through the data analysis explained in Sections 5.1 through 5.6. Additional discussion on calculating volumes from Unique sites is included in Appendix C. The GRID model is explained further in Section 5.8.

4.3.1.2 Concentrations

Concentrations will be calculated by multiplying the chemical concentrations (mass of chemical per volume of water sample) by the volume of water discharging at the location over a set time to yield a load in mass/time.

$$L = C_w \text{ x } V_{month}$$

Where:
L = Load (microgram [µg]/month)

C_w = Measured concentration (µg/L) for land use or site

V_{month} = Volume of discharge from land use or site over a month (L/month)

4.3.2 Sediment Trap Method

For suspended sediment, chemical concentrations (mass chemical/mass sediment) are multiplied by TSS concentrations (mass sediment/volume water sample) measured in water samples and the volume of water discharging at the location over a set time to yield a chemical load in mass/time.

4.3.2.1 Runoff Volumes

As with the stormwater method, runoff volumes will be calculated, using the City of Portland Bureau of Environmental Service's GRID model, for each section of the river as shown in Figure 4-2. Additionally, runoff volumes will be calculated for each unique industrial location as loads to the Site from these locations will be input into the model separately. Additional discussion on calculating volumes from Unique sites is included in Appendix C. The GRID model is explained further in Section 5.8.

4.3.2.2 TSS/TOC

TSS concentrations (mass of sediment per volume of water sample) will be used in order to relate chemical concentrations (mass of chemical per mass of sediment) measured in sediment to stormwater loading to the Site. Total organic carbon (TOC) concentrations will be used to normalize the sediment chemical concentrations and multiplied by TOC content in stormwater to determine loads on an organic carbon (instead of TSS) basis. Both TOC-based and TSS-based loads will be calculated and the results compared.

4.3.2.3 Loading Concentrations

Concentrations will be calculated by multiplying the chemical concentrations (mass of chemical per mass of sediment sample) by the TSS (mass of sediment per volume of water sample) by the volume of water discharging at the location over a set time to yield a load in mass/time.

$$L = C_s \text{ x TSS x } V_{month}$$

Where:
L = Load (µg/month)

C_s= Measured concentration (µg/kg) for land use or site

TSS = Total suspended sediment (kg/L) in stormwater measured for land use or site

V_{month} = Volume of discharge (L/month) from land use or site over a month

Alternatively, TSS can be replaced with TOC (kg/L) in the above equation and C_s can be converted to TOC normalized value in µg/kg of organic carbon (OC) to yield the load in kg/month on an OC-basis.

5.0 Stormwater-Based Loads

This section details the method for evaluating stormwater data and using the data to calculate stormwater loads to the Site. As discussed previously, to demonstrate the data analysis methods more clearly, a preliminary data analysis was conducted using a subset of ten analytes from the stormwater data collected during the first round of stormwater sampling. The data used for this preliminary data analysis included the first round of composite stormwater data collected by LWG as well as data collected by the Port of Portland from March through June of 2007. The full results of this data analysis are contained in Appendix A for reference, and examples are shown in the text.

The final data analysis using the methods presented in this section will be completed after all stormwater data have been validated and will be presented in the RI in an appendix supporting the source, fate, and transport analysis.

It should be noted that discussions of the Stormwater Technical Team focused first on the handling of non-detects. However, per the ProUCL guidance, it is acceptable and even expected that preliminary analyses of data sets, including outlier analyses will be conducted making simple assumptions about non-detects (i.e., assuming half the detection limit). Consequently, such an approach is proposed below, and this approach was used in the preliminary analysis examples using the first round stormwater data. Subsequent to the outlier analyses, a detailed non-detect analysis following ProUCL methods including reassignments of non-detect values as appropriate is proposed to establish the final data set.

The steps for evaluating stormwater data, as detailed in Sections 5. 1 through 5.6 include:

1. Database development and rules (Section 5.1) – explains construction of the stormwater database and why some data were not included in the preliminary analysis

2. Handling of duplicates (Section 5.2) –The objective of this step is to compare paired field duplicate/lab replicate and normal results and identify outliers.

3. Categorization of Sites Within Land Uses (Section 5.3) – These steps are an exploratory analysis to evaluate Unique and Representative Heavy Industrial Sites to identify locations and chemicals that could be reclassified from Unique to Representative or from Representative to Unique. This should be considered as an initial evaluation to identify which locations and chemicals warrant additional evaluation for potential reclassification. The reclassification should also include professional judgment, such as site knowledge, to determine if the reclassification is warranted.

4. Detailed Outlier Analysis (Section 5.4) - In this analysis chemicals are evaluated for the presence of outliers for each combination land use category (e.g., Representative heavy industrial category) and whether such outliers can be related to other known variables about the monitored locations (such as drainage basin size, types of storms sampled, etc.) using statistical and graphical methods.

5. Summary of Analysis (Section 5.5) – This section contains a summary of the analysis and shows which chemicals at which sites could be reclassified or are outliers.

6. Non-Detect Analysis (Section 5.6) - The method for non-detect handling involves evaluating the proportion of non-detects and then adjusting the non-detect data.

It should be noted that use of the term outlier does not necessarily imply that a data point will be excluded from the loading estimate data set. Rather, this term refers to sample points that appear to be outliers in a distribution as identified through an exploratory analysis. Such outliers may in fact represent important information about the variability of stormwater that should be included in loading estimates, particularly given the relatively small number of samples involved in this analysis.

5.1 DATABASE DEVELOPMENT AND RULES

Once the laboratories have completed their internal quality assurance/quality control (QA/QC) checks, they will export the analytical data (i.e., sample, test, batch, and result information) into comma-delimited text files with data columns arranged in an order that is recognized by the project's Environmental Quality Information System (EQuIS) database. The Electronic Data Deliverables (EDDs) will be e-mailed to Integral, where they will be checked for proper EQuIS structure and appended with specific information that was unknown by the laboratories, such as sampling location and composite, field replicate, and split information. If any problems are found in the structure of the EDDs, the laboratory will be notified and asked to correct the problem and resubmit the EDD. Each e-mailed EDD transmission, with the original, unaltered EDD attachment, will be stored to document and track the laboratories' delivery of electronic data to Integral.

When the EDDs are correct and complete, they will be checked electronically by loading them into the temporary section of Integral's LWG project database. During the loading process, EQuIS checks the EDDs for correct lookup codes (e.g., for analytes, test methods, and sample matrices); for proper relationships for results, tests, batches, and samples (to ensure that all results matched with a test, tests matched with samples, and sample/test pairs matched with batches); and to ensure that all derived samples (e.g., replicates, splits, and matrix spikes) have corresponding parent samples.

In addition, EQuIS also checks "less important" characteristics, such as date and time formats and text field lengths, to ensure consistency throughout the database. Any error will prevent the EDD from loading until the error is corrected. If errors are found that are related to the way the laboratory reported the data or constructed the EDD, the laboratory will be notified and asked to correct the problem and resubmit the EDD. If the errors are related to Excel's automatic formatting of the date and time fields, for example, then the error will be corrected, and steps will be taken to avoid a repeat of the problem (e.g., changing default settings in the software). Successfully loaded EDDs will be saved to document and track the data that are loaded into Integral's LWG project database.

Each verified and accurate EDD will be provided to the data validation contractor (EcoChem) for data review and validation. These EDDs will also be stored in a temporary section of the project database, where they could be queried and examined, if desired, until validation was complete. When EcoChem completes validation of the data by sample delivery group (SDG) or small groups of SDGs, they will apply validator qualifiers and reason codes to the data in the temporary section of the database. The validated data will then be merged into the permanent project database. During the merging process, all previously performed electronic checks will be repeated to ensure that nothing is incorrectly modified with the application of the validation results.

Integral's LWG project database contains all of the data reported by the analytical laboratories. This includes field and laboratory replicates, laboratory dilutions, results for the same analyte from multiple analytical methods (e.g., SW8270 and SW8270-SIM), and laboratory QA samples such as matrix spikes, surrogates, and method blanks. The data-handling rules described in *Guidelines for Data Averaging and Treatment of Non-detected Values for the Round 1 Database* (Kennedy/Jenks et al. 2004) are typically used to create a simpler data set for the Site Characterization and Risk Assessment (SCRA) database users; the data set contains only one result per analyte per sample and excludes all of the laboratory QA results. This involves creating a SCRA database that excludes laboratory QA results, contains only the most appropriate dilution result and analytical method for each analyte, and contains the average of the replicates. For this data set, there will be several deviations from the SCRA database rules, based on agreements made by the Stormwater Technical Team's decision to include all results, including laboratory replicates and field duplicate results in the stormwater project database. Therefore, the SCRA reduction step of reporting only one result for a sample will not be employed for the stormwater project database because the Stormwater Technical Team requested inclusion of all laboratory replicate and field duplicate results for evaluation.

Once the LWG database has been prepared, it will be queried to reduce it to a "working database" to include just those chemicals on the subject loading estimate list per Section 3. Where available, both total and dissolved results for an analyte will be included. Particular records may be peremptorily excluded from the working database due to various factors that have been discussed with the Stormwater Technical Team. In the preliminary analysis of the first round data, it was determined that some data should not be included as follows:

- St. Johns Bridge – After the conclusion of The first round of sampling, it was discussed by the Stormwater Technical Team and EPA that the data from St. John's Bridge may not be representative of long-term transportation loadings in general because the bridge was recently repaved and repaired. Therefore, a new location (Hwy 30 B) was selected for sampling during the second round so there would still be two major transportation locations. Once all of the stormwater data are available, the St. John's Bridge data will be compared to the two other major transportation locations during the final data analysis. If the St. John's Bridge data differs from the other two locations, then the St. John's Bridge data could be handled as unique site. That is, the data from that site are only used to represent loads from that particular drainage area (in this case the St. Johns Bridge deck. If the St. John's Bridge data are similar to the other major transportation data, then the St. John's Bridge data could be combined with the major transportation data.

- WR-4 – The "wrong" basin was sampled. That is, the outfall sampled was thought to drain the primary area of interest on the Sulzer site, but further analysis of updated drainage plans for the site indicated it drains another area entirely.

- H30 (renamed Yeon Mixed Use) – As noted above, this location included a substantial portion of industrial drainage in addition to Highway 30. Consequently, the stormwater technical team, with EPA, decided that it could not be defined as major transportation. In the future full analysis, these data will be used in the multiple land use category as defined in Section 4.1.

All the samples excluded in the preliminary analysis for the above reasons are listed in Table 5-1 and explained further in Section 5.3.1.1.

During the construction of the working database, chemical names will be 'coded' to meet variable requirements for some software packages (e.g., Systat ver. 11). These coded variable names appear in example outputs from the preliminary analysis for many of the analyses subsequently described below. Table 5-2 provides a list of chemical names and their coded equivalent for reference. A similar table will be prepared for the future full analysis. Similarly, several fields will be either renamed from existing designations or new ones will created in the working database for convenience, clarity, and to document results of analyses performed during the evaluation. Table 5-3 provides an example of these field headings from the preliminary analysis and a definition for each designation.

5.2 HANDLING OF DUPLICATES

The objective of this step of the data reduction process is to compare paired field duplicate/lab replicate and normal results for the subset of samples for which these data are available. (Field duplicates were generated in the field lab based on composite water samples from the same container of mixed composite water. Laboratory replicates were generated in the lab by splitting sample water in the same submitted sample container into two aliquots for separate laboratory analysis.) For simplicity in this document, field duplicates and lab replicates are collectively referred to as "duplicates" and these two types of paired samples will be handled the same for the purpose of generating loading estimates.

Samples with relatively consistent normal and duplicate results will be combined by averaging them prior to further analysis. Samples with divergent normal and duplicate results will be identified and will either be averaged or included as two separate data points for subsequent data analysis tasks. Samples identified with divergent normal and duplicate results will be further investigated to determine if an error or cause can be identified to account for the observed divergence in the normal and duplicate results. Analysis of normal and duplicate results and identification of divergent normal and duplicate results will be performed on a chemical-specific basis. Samples included in the preliminary analysis duplicate examination are listed in Table 5-4 for each analyte. Note that during the preliminary data analysis, lab replicate data were not included in this step of the exploratory data analysis. However, for future data analyses with the full data set, we propose that all duplicates (i.e., field duplicates and lab replicates) be evaluated in the same way.

5.2.1 Duplicate Outlier Tests

In this analysis, the objective is to identify samples that are outliers based on the differences between their paired normal and duplicate results. Consequently, a measure of variability (coefficient of variation; COV) between the normal and duplicate result for a given sample will be calculated. Graphical methods and outlier tests provided by ProUCL will then be used to identify potential outliers.

In this analysis, the COV will be calculated for each sample using the normal and duplicate result. The COV is a normalized, unitless measure of variability. In practice the COV is calculated as the ratio of the standard deviation (s) to the mean (x) of sample:

$$COV = \frac{s}{x} \times 100$$

Because the COV is a normalized value, it is more useful than just the standard deviation for comparing values with widely divergent means, as the standard deviation must always be considered in the context of the mean.

5.2.1.1 Method Description

In order to identify samples with widely divergent normal and duplicate results, the COV will be first calculated for each sample with normal and duplicate results on a chemical specific basis. Example COVs from the preliminary analysis are shown in Table 5-5.

Next, graphical methods (QQ-plots) and goodness-of-fit (GOF; Shapiro-Wilk test, a=0.05) of COV on a normal scale will be run for each analyte using ProUCL Version 4.0 (ProUCL; USEPA 2002a, 2002b). Example plots from the preliminary analysis are shown in Figure 5-1 for total PCB-153 and total PCB-194. All plots from the preliminary analysis for other analytes are included in Appendix A.

Next, Dixon's Outlier Test (Dixon's) will be run for each chemical using ProUCL. Samples will be identified as potential outliers at a 5 percent significance level (a=0.05) using the Dixon's test. Because Dixon's test only identifies one outlier (both upper- and lower-tails of the distribution), iterative segregation of candidate outliers will be performed until no potential outliers are identified in the remaining data at a 5 percent significance level.

Finally, QQ-plots and GOF test for a normal distribution will be rerun for each chemical with candidate outliers (if any) segregated. Dixon's Outlier Test requires that the remaining data set with outliers segregated be normally distributed for results to be valid.

In the preliminary analysis of duplicate outliers, several chemicals were not included because insufficient numbers of duplicate results were available (N=3; dissolved lead and dissolved arsenic).

5.2.1.2 Example Results

Using the preliminary first round data, Dixon's test, using the COV of duplicate results, identified three chemicals with potential outliers at the 5 percent significance level: total lead, total PCB-153, and total PCB-194. For each chemical, segregating the highest COV value resulted in no additional outliers being identified during the next test run. For each chemical, the resulting data set with the outlier segregated fit a normal distribution according to both graphical and GOF tests, indicating a valid result was achieved using Dixon's test. Q-Q plots and GOF test results for total PCB-153 and total PCB-194 are provided as examples in Figure 5-2.

5.2.2 Identification of Divergent Results

Any samples identified as having divergent normal and duplicate results based on the analysis described above will be segregated from the sample set. These segregated data will be evaluated to determine whether to average the normal and duplicate results or include them as two separate data points. The data will not be removed from the database since they are both valid samples within the EPA approved FSP methods for the study.. The uncertainty created by these divergent duplicate and normal results will be addressed during the loading analysis, for example, by comparing the change in concentration statistics when the data points are included separately versus as one average. All other samples with duplicate results will be averaged and the result associated with the parent sample code (i.e. normal sample ID). This data set will then be included in subsequent data analysis tasks

For the preliminary analysis, Table 5-6 presents those divergent normal and duplicate results based on the preliminary analysis performed above. These samples were removed from subsequent preliminary analysis for the example tasks presented below. However, during the full data analysis, the divergent normal and duplicate results will not be handled as noted above.

5.3 CATEGORIZATION OF SITES WITHIN LAND USES

5.3.1 FSP Categorizations

The SSR segregated stormwater sample locations into one of several land use categories as discussed in Section 4.1. These included heavy industrial, light industrial, open space, residential, and transportation land use categories. In addition, some heavy industrial sites were categorized as Unique, anticipating that these would not be used in the calculation of Representative heavy industrial stormwater loads.

The primary purpose of this step in the stormwater loading analysis is to use both quantitative and qualitative (i.e., graphical) methods to evaluate whether the assignments of land use categories and Unique heavy industrial sites in the FSP contain outliers that could be reassigned to some other land use category. In essence, this step of the evaluation is testing whether the *a priori* assignments made in the SSR are supported by the data obtained, or alternatively, whether these actual data indicate a different categorization is more appropriate. This reclassification analysis should be considered as a preliminary evaluation to identify which locations and chemicals warrant additional further consideration for reclassification. The reclassification should also include professional judgment, such as site knowledge, to determine if reclassification is warranted.

Specifically, anticipated tasks for this step of the evaluation include:

- Conducting graphical and statistical analysis of chemical results for samples in the Representative heavy industrial land use category to determine if any locations should be considered Unique heavy industrial sites for the purposes of stormwater loading evaluations on a chemical-specific basis.

- Comparing distributions of the Representative heavy industrial land use category and Unique heavy industrial sites to determine if any Unique sites should be considered part of the Representative heavy industrial land use category on a chemical-specific basis.

- Comparing distributions of Representative heavy industrial and light industrial land use categories to determine if heavy industrial and light industrial land use categories should be combined on a chemical-specific basis.

It should also be noted that since the development of the SSR, an additional *a priori* assumption was identified about the OF-22B location. Due to the area history of pesticide-related manufacturing, the site is expected to be Unique for pesticides. Stormwater pesticide data were only obtained from this site and WR-96. Consequently, there are insufficient data to compare these data to the Representative heavy industrial land use category and OF-22B pesticide data will be simply excluded from the Representative heavy industrial data set, although other chemicals from OF-22B will be included.

5.3.2 Outlier Analysis for Representative Heavy Industry Category

5.3.2.1 Method

For this task, both visual and statistical methods will be used to identify outliers in the Representative heavy industrial land use category data set. A step-wise process for performing this analysis is described below:

1. GOF tests will be performed for each chemical using ProUCL according to the following:
    a. The Shapiro-Wilk statistic for normal and lognormal distribution testing and the Kolmogorov-Smirnov statistic for gamma distribution testing will be used
    b. All tests will be performed at a significance level of 95 percent (a=0.05).
    c. All non-detect results will be included at one half the detection limit (ND=1/2DL)
    d. Samples with four or fewer results will not be carried forward in analysis

    Example results for this step using the first round data set are shown in Table 5-7.
2. Next, graphical methods will be used to visually identify potential outliers according to the following:
    a. Q-Q plots and Box plots will be generated for each analyte using Systat 10.2 (Systat Software, Inc.). For each analyte, plots will be generated using both a normal and lognormal distribution. Although the preliminary analysis indicated that few chemicals fit a normal distribution, visual identification of outliers using a lognormal scale may ‘mask’ potential intermediate outliers. Graphs using a normal distribution will be used to support selection of potential analytes when identification of an outlier using a lognormal distribution is ambiguous.

   b. To identify candidate outliers using the graphical methods, professional judgment will be used to evaluate several conditions, including:
      i. Is there obvious separation or 'gaps' between groups of data along the Q-Q plot?
      ii. Are there observations separated from the main group in a Q-Q plot
      iii. Are there observations that extend beyond the 'whiskers' of the box plot
   c. Observations that are identified as candidate outliers using graphical methods will be identified and recorded.
3. Next, statistical methods will be used to identify candidate outliers for each analyte according to the following:
   a. Full data sets for each analyte will be evaluated using Rosner's Test (N>=25) or Dixon's test (N<25) as appropriate using ProUCL. Each test will be run using a 5 percent significance level (a=0.05). Observations that are identified as potential outliers will be flagged and removed from the data set for each chemical.
   b. On a chemical-specific basis, outliers will be iteratively removed from the data set until no outliers are identified at the 5 percent significance level.
   c. Finally, GOF testing for a normal distribution (e.g., Shapiro-Wilk test statistic) will be performed for each chemical with the candidate outliers removed. Both Dixon's and Rosner's Tests require that the remaining data be normally distributed for results to be valid (USEPA 2007).
   d. Observations identified as candidate outliers using these tests will be recorded.

   Example results of the above procedures using the first round data set are summarized in Table 5-8.
4. Next, a decision rule will be used to identify locations that are outliers from among the candidate outliers within the Representative heavy industrial land use category data set as follows:
   a. If the same observations are identified as outliers using visual plots on normal scale, visual plots on lognormal scale, and statistical outlier tests, then the observation will be flagged as an outlier, else
   b. If removing outlier(s) identified using the statistical test results in normal distribution, then those observations will be identified as outliers, else
   c. If removing outlier(s) identified using graphic plots on normal scale results in a normal distribution for the remaining data, then those observations will be identified as outliers, else
   d. Outliers identified using graphic plots on lognormal scale will be identified as outliers
5. Finally, since the objective is to identify sample locations (vs. individual observations) that should be considered outliers for the Representative heavy industrial land use category, if a simple majority of samples from a location are identified as outliers, then that location will be identified as an outlier. Such

location outliers will then be identified so that they can be further examined using professional judgment, such as site knowledge, to determine whether reclassification is actually warranted.

5.3.2.2 Example Using First Round Data

Figure 5-3 includes example Q-Q plots and box plots for acenaphthylene and PCB-066 on normal and lognormal basis. Non-detects were included at one half detection limit in the graphs. The number of samples identified as candidate outliers is provided in Table 5-8. Candidate outliers based on normal and lognormal data distributions are included. The numbers of outliers based on the ProUCL statistical tests are summarized in Table 5-8. Valid results (e.g., remaining observations are normally distributed) are identified. One outlier was identified for acenaphthylene using both statistical and graphical methods. For PCB-066, three outliers were identified using statistical and graphical methods. The final column in the table identifies the final number of observations identified as outliers using the decision rule described above. Table 5-9 lists each observation and its status as an outlier on a chemical-specific basis. Complete results for all chemicals are presented in Appendix A.

Locations that are recommended for additional evaluation for possible reclassification as Unique heavy industrial locations as result of the preliminary analysis are listed in Table 5-10. Five of six locations (WR-20, WR-177, WR-183, OF22, and OF22B) were recommended for additional evaluation for possible reclassification as Unique heavy industrial sites for multiple chemicals. Only one location, OF16, was recommended for reclassification of only one chemical. The methods below describe performing analyses separately using both the original classification of Unique heavy industrial and Representative heavy industrial land use category in the FSP shown in Table 4-1 Such a “side-by-side” preliminary analysis was conducted as a part of this exploratory analysis to provide a point of comparison between the two different classifications. This in turn helps consider the potential impact on loading estimates of conducting reclassifications indicated by the data analysis.

5.3.3 Comparison of Heavy Industry Representative Category and Unique Sites

The purpose of this task is to determine if the distributions of the Unique heavy industrial sites (as a group) and the Representative heavy industrial land use category indicate that these two data sets may be combined into a single population. A second objective is to determine, if the two distributions are significantly different, whether removing individual locations from the analysis would remove the differences between data sets and allow the remaining data to be combined into a single population. This analysis should be considered as a preliminary evaluation to identify which locations and chemicals warrant additional consideration for reclassification. The reclassification should also include professional judgment, such as site knowledge, to determine if reclassification is warranted.

5.3.3.1 Method – Distribution Comparison

For this task, both visual and statistical methods will be used to compare the distributions of Unique heavy industrial group and Representative heavy industrial land use category. Before proceeding with this comparison, it would presumably be necessary to reclassify the data based on the results of outlier analysis task described in the previous section. The methods below describe performing this outlier analysis separately using both the original classification of Unique heavy industrial and Representative heavy industrial land use category in the FSP shown in Table 4-1, as well as the reclassified locations performed in the previous outlier analysis task. Such a "side-by-side" preliminary analysis was conducted on the first round data set to provide a point of comparison between the two different potential classifications. As noted previously, reclassification should only be considered if additional professional judgment based on site knowledge appears to indicate a Site is truly misclassified. Once such a determination is made, the subsequent data analysis would be made on the reclassified data set only. We would not anticipate conducting a side-by-side analysis in the future full data analysis.

After this initial step, a step-wise process for performing this outlier analysis (including the side-by-side analysis) is described below:

1. Use statistical methods to compare sample distributions between Unique and Representative heavy industrial data for each chemical. In this analysis, two different types of non-parametric statistical tests provided in ProUCL will be used to compare the distributions. They are:
    a. Quantile Test – The quantile test (EPA 1994) is a non-parametric test and is useful to detect a shift to the right in the right-tails of data distributions. The quantile test, when used in parallel with Wilcoxon-Mann-Whitney (WMW) or Gehan test, provides the user with stronger evidence to make decisions on whether there are significant differences between two sets of observations. As the test focuses on the right tail of the distributions, it can have more power to detect differences than the Gehan, WMW, or the two-sample t-tests (USEPA 2007)
    b. WMW or Gehan Test – The WMW is a non-parametric test used for determining whether a difference exists between two population distributions. The WMW test tests whether or not measurements (location, central) from one population consistently tend to be larger (or smaller) than those from the other population based upon the assumption that the dispersion of the two distributions are roughly the same. The Gehan test is a non-parametric test for determining differences between two sites when the data sets have multiple censoring points and detection limits. Thus, this test was used when multiple detection limits were present in the data set.
    c. Null and Alternative Hypothesis – For each test described above, the null and alternative hypotheses are of the form:

        i. Ho: Concentration in the Unique heavy industrial locations is comparable to that of the Representative heavy industrial locations (≤ 0)
        ii. Ha: Concentration in the Unique heavy industrial locations is greater than that of the Representative heavy industrial locations ($\mu_{UNIQUE} - \mu_{REPRESENTATIVE} > 0$)
2. Next, graphical methods will be used to visually identify potential divergent distributions between these two groups according to the following:
    a. Side by side Q-Q plots and box plots of Representative and Unique heavy industrial locations will be generated for each analyte using Systat 10.2 (Systat Software, Inc.). For each analyte, plots will be generated using both a normal and lognormal distribution.
    b. To identify divergent distributions using the graphical methods, professional judgment will be used to evaluate several conditions, including:
        i. Is there obvious vertical separation between populations on the Q-Q plot, indicating that one population is consistently greater than the other?
        ii. Is there obvious divergence between populations above the 70th percentile on the Q-Q plot, indicating that one population may be 'stretched' to the right tail?
        iii. Are there obvious differences between the median and h-spread (difference between the first and third quartiles) of the two populations in the box plots?
        iv. Are there differences in the tails of the two population distributions and indicated by extreme values (exceeding the 'whiskers') on the box plots?
3. A decision rule will be used to determine if the Unique and Representative heavy industrial groups could be combined or should remain independent for each chemical. The following decision rule will be applied:
    a. If the quantile test and graphic methods show significant divergence, then an attempt will be made to remove the differences between groups by selectively removing observations from the upper-tail of the Unique group. The quantile test and graphic approach will be rerun with these samples removed.
        i. If condition 3b (below) is now met with selected samples removed, then the remaining Unique samples will be reclassified to Representative; locations with observations that are removed will not be reclassified.
        ii. If removing observations does not remove the divergence between the Unique and Representative groups, then no locations will be reclassified.
    b. If the quantile test and graphic methods do not indicate significant divergence, then the Gehan or WMW test will be performed to verify the result.

i. If the Gehan or WMW tests do not reject Ho, then Unique samples will be reclassified to Representative.
ii. If the Gehan or WMW tests reject Ho, the samples will not be reclassified

c. If quantile test and graphic methods are not in agreement, professional judgment will be used to recommend whether these groups should be combined or not.

5.3.3.2 Example Using First Round Data

Preliminary analysis results using the first round data are summarized in Table 5-11. Q-Q and box plots are included for example in Figure 5-4 for total arsenic and benzo(a)pyrene using the reclassified data. The quantile tests and graphical methods indicated significant divergence for total arsenic, dissolved arsenic, dissolved lead, total lead, total PCB-153, total PCB-194, and TOC using the reclassified data. With the exception of total arsenic, the Gehan or WMW test also supported the alternative hypothesis that Unique and Representative populations were different. For chemicals that did not reject the null hypothesis that the populations were equivalent using the quantile test and graphical methods, the Gehan or WMW test generally supported that conclusion with one exception. The null hypothesis was rejected for total PCB-153, using the Gehan test. Removing samples from the Unique group removed divergence between the two groups for total lead and TOC. Differences between the distributions of other chemicals were considered too great to reasonably remove samples to remove divergence.

For the original data classification, total arsenic, dissolved lead, PCB-153, and PCB-194 demonstrated significant divergence using the quantile and graphical methods. Gehan or WMW tests did not identify significant differences between Unique and Representative sites. This is not unexpected, as the quantile test is generally more sensitive, particularly when differences are in the upper range of the distributions. Removing samples from the Unique group removed divergence between the two groups for PCB-153; differences were considered too great to reasonably remove the divergence for other chemicals. Complete results for all chemicals using both the reclassified and original data classifications are presented in Appendix A.

Based on the preliminary data analysis, data from the Unique heavy industrial category would be recommended for further evaluation for possible reclassification as Representative heavy industrial locations for the following chemicals using the reclassified data:

- Acenaphthylene
- Benzo(a)pyrene
- Total lead
- PCB-018

- PCB-066
- PCB-106
- TOC
- TSS

For total lead and TOC, this reclassification is based on removal of selected stations. For total lead, stations WR-183 and WR-384 should be retained in the Unique heavy industrial category, but all other locations could be reclassified as Representative. For TOC, only station WR-183 should be retained in the Unique heavy industrial category. All other Unique locations for these chemicals could be reclassified as Representative location type. By comparison, using the original data classification results in the same recommendations as above with the addition of PCB-153 to the list. One station, WR-384 would be retained as Unique for this chemical and all others could be reclassified as Representative.

This preliminary result may be somewhat surprising given that on a chemical-specific basis, a large number of assumed Unique heavy industrial sites appear to be not differ greatly from other heavy industrial sites that were assumed to be more representative of general heavy industrial land uses. At least two separate conclusions could be drawn from this:

1) Heavy industrial sites represent a wide range of conditions and should all be considered unique to some extent or,

2) It is difficult to determine *a priori* that some industrial sites are more unique than others and unless proven otherwise by actual data, locations should not be assumed to be unique.

Also, the side-by-side analysis indicates that, with only the exception of PCB-153, using the original data classification or the reclassified data from the previous step results in the same conclusions.

5.3.4 Comparison of Heavy Industry and Light Industry Categories

The purpose of this task is to determine if the distributions of the Representative heavy industrial and Representative light industrial land use categories indicate that these two data sets may be combined partially or wholly into a single population for stormwater loading calculations. For comparison purposes, this task was conducted in the preliminary analysis of the first round data using two different data sets: 1) the original land use categories assigned to stations in the FSP ('original') per Table 4-1 and 2) using the reclassified heavy industrial categories discussed in Sections 5.3.3 and 5.3.4. As noted previously, reclassification should only be considered if additional professional judgment based on site knowledge appears to indicate a Site is truly misclassified. Once such a determination is made, the subsequent data analysis would be made on the reclassified data set only. We would not anticipate conducting a side-by-side analysis in the future full data analysis.

5.3.4.1 Method – Distribution Comparison

For this task, both visual and statistical methods will be used to compare the distributions. The step-wise process for performing this analysis is equivalent to the methods described above for Section 5.3.3.1. Briefly, the steps are:

1. Use statistical methods (quantile test, Gehan's, WMW tests) to compare data distributions between Representative heavy industrial and Representative light industrial land use categories for each chemical.

2. Use graphical methods (Q-Q plots and box plots) to visually identify potential divergent distributions between the two land use categories.

3. Apply the decision rule described above in Section 5.3.3.1 to determine if the data from the two categories can be combined (in whole or part) or should remain independent (in whole or part) for each chemical.

5.3.4.2 Example Using First Round Data

Results of the preliminary analysis are summarized in Table 5-12 using the original data classifications, as well as the reclassified data. Data distributions for two chemicals, total arsenic and benzo(a)pyrene, are illustrated in Figure 5-5 for example. Using the original classification of the data, total arsenic demonstrated significant statistical (quantile test) and graphic divergence between the heavy industrial and light industrial land use category data sets in the upper-tails of their distributions. Alternatively, the reclassified data did not demonstrate statistical or graphical divergence in the upper-tails or midrange of the data distributions. Benzo(a)pyrene demonstrated both statistical and visual divergence in both the reclassified and original data classifications. Complete results for all chemicals are presented in Appendix A.

Based on the preliminary analysis using the reclassified categories, data from the Representative heavy industrial and light industrial land use categories are recommended for further evaluation of possible reclassification as combined (i.e. heavy/light industrial) locations as follows:

- Total arsenic
- Total and dissolved lead
- PCB-018
- PCB-066
- PCB-194

Alternatively, using the original classification of the data in the FSP, only one chemical, total PCB-018, would likely be recommended for combining the two land use categories. Several chemicals had somewhat ambiguous or conflicting results between statistical and graphical methods for the original data classification. Generally, the reclassified data had less ambiguous or conflicting results.

Overall, the results with the reclassified data suggest that for many chemicals there is no substantial difference between the heavy industrial and light industrial land use categories. Conversely, when the original classifications are used, there appears to be a somewhat consistent difference between the two categories (except for one chemical). Additional analysis of the results would be needed to determine why the inclusion of some Unique heavy industrial sites into the Representative heavy industrial land use category would make the Representative heavy industrial overall, more like light industrial. As noted previously, reclassification should only be considered if additional professional judgment based on site knowledge appears to indicate a Site is truly misclassified. Once such a determination is made, the subsequent data analysis would be made on the reclassified data set only. We would not anticipate conducting a side-by-side analysis in the future full data analysis.

5.4 DETAILED OUTLIER ANALYSIS

5.4.1 Detailed Outlier Analysis

In this analysis, chemicals will be evaluated for the presence of outliers for each combination land use category (e.g., Representative heavy industrial category) using statistical and graphical methods. Next, other stormwater related variables that might impact data distributions and account for the apparent outliers will be investigated (i.e., drainage area, percent impervious surface, antecedent storm conditions, rainfall amount, percent of hydrograph sampled, and presence of non-stormwater discharges).

The analyses in the previous sections were focused on 1) identifying outlier duplicates and removing them from the data set as necessary; and 2) determining the land use categories that each sampling location best fits within. The primary focus of the detailed outlier analysis in this section is to identify individual sample outliers within each land use category, and then understand what factors might be contributing to the presence of those outliers. This information may in turn be useful in determining whether some sample outliers or groups of sample outliers should be excluded, or otherwise handled differently, during the loading estimates due to some consistent bias or inapplicability to the study.

For the preliminary analysis using the first round data, this task was conducted using two different data sets:

1. The original land use categories assigned to stations in the FSP as summarized in Table 4-1 (‘original’)

2. The reclassified land use categories resulting from the analysis discussed in Section 5.3 (‘reclassified;’ see above)

As noted previously, reclassification should only be considered if additional professional judgment based on site knowledge appears to indicate a Site is truly misclassified. Once such a determination is made, the subsequent data analysis would be made on the reclassified data set only. We would not anticipate conducting a side-by-side analysis in the future full data analysis.

5.4.1.1 Methods

In the first step of the analysis, outliers will be identified using the same procedure described in Section 5.3.2.1. Briefly, this procedure is:

1. GOF tests will be performed for each chemical using ProUCL.

2. Next, graphical methods (Q-Q and box plots) will be used to visually identify potential outliers.

3. Next, statistical methods (Dixon’s or Rosner’s test) will be used to identify candidate outliers for each chemical.

4. Finally, a decision rule for evaluating the above analyses will be applied to identify samples that are outliers from among the candidate outliers.

Both statistical and graphical methods will be used to look for relationships between outliers and stormwater variables. For statistical methods, classification trees will be evaluated for chemicals that have sufficient numbers of outliers to perform the analysis.

Classification trees are directed graphs beginning with one node and branching to many. The top node contains the entire sample. Each remaining node contains a subset of the sample in the node directly above it. Each node can be thought of as a cluster of observations that is to be split by further branches in the tree. For quantitative variables (i.e., stormwater variables), splits are created by determining cut points on a scale. The cut points are determined by looking at all possible n-1 splits of the observations for each variable. The split is chosen to minimize the within-cluster sum of squares. Splitting continues until the resulting nodes no longer contribute to overall prediction (which includes a cost of complexity, where there is a ‘penalty’ for increasing the number of parameters in the model tree). The ultimate result of the analysis is to identify whether and to what degree stormwater variables can accurately split the observations between outlier and non-outlier groups.

Systat Version 10.2 (Systat Inc.) will be used to perform the classification tree analysis. A minimum split value of 4 will be required for a node and a least square loss function will be requested. Each model calculates a proportional reduction in error (PRE), which is a measure of the model to accurately classify the observations and is a proportion of the total variation in the observations (outliers and non-outliers) accounted for by the stormwater variables. It is interpreted similar to an R^2 for a regression model. Professional judgment will be used to categorize the predictive ability of the model using the stormwater variables. As such, the predictive ability of stormwater variables to identify outliers will be identified as low (PRE<0.4), moderate (0.4≤PRE<0.7), or high (PRE≥0.7).

The second approach will be to use scatterplots of the observations and stormwater variables to identify apparent relationships between outliers and stormwater variables. Specifically, both normal and lognormal scatterplots of outliers and non-outliers identified in the first step of the analysis will be plotted against each stormwater variable for each chemical. Scatterplots will be reviewed to identify clustering or trends between outliers and variables.

5.4.1.2 Example Using First Round Data

Results of the outlier analysis are summarized in Table 5-13 and 5-14 for the original and reclassified data, respectively. Chemicals with less than five observations were not included in the outlier analysis. Data distributions, Q-Q plots, and box plots are illustrated in Figure 5-6 for the following two examples: benzo(a)pyrene Unique heavy industrial (Original Classification) and PCB-194 Representative light industrial (Original Classification). For benzo(a)pyrene, Rosner's outlier test and the graphical evaluations all identified seven potential outliers. For this case, despite the lack of a valid result for the outlier test, all seven observations were identified as outliers due to the consistent agreement between statistical and graphical methods. For PCB-194, only one outlier was identified using Dixon's outlier test and using visual plots on a lognormal scale. Three outliers were identified using visual plots on a normal scale. The original data set fit a lognormal distribution; removing the single outlier resulted in a normal distribution. Removing the single outlier resulted in a valid result for the Dixon's test creating a normal distribution for the remaining samples. Thus, a single outlier was identified for this data set.

Next, classification trees and scatterplots against the stormwater variables were constructed for each data set that contained outliers. Table 5-15 contains the stormwater variable statistics for each site evaluated in the classification trees and scatterplots. Classification tree analysis was limited to data sets with at least four outliers identified. An example classification tree and scatterplot for benzo(a)pyrene is provided in Figure 5-7. For benzo(a)pyrene the variable 'Drainage,' which is a measure of site drainage area in acres, can be used to identify potential outliers with a moderate degree of predictive ability (PRE=0.597). In this example, locations with site drainage less than 18.3 acres but greater than equal to 8.0 acres are predicted to be outliers. It is noteworthy that there is no *a priori* reason to suppose that such an acreage range is inherently likely to yield outliers and such a pattern likely does not reflect any true cause and effect. A more reasonable result would be that very large or very small drainage areas yield outlier results, but in this example, this does not appear to be the case.

In the above example classification tree for benzo(a)pyrene, two outliers are not identified and one non-outlier is incorrectly selected as an outlier. For total PCB-194, classification tree analysis was not performed due to the limited (n=1) outliers. A scatterplot matrix of observations with stormwater variables is illustrated in Figure 5-8 for PCB-194. The example classification tree shows that there does not appear to be any apparent influence of stormwater variables on the single outlier, noting that it is difficult to distinguish any patterns when there is only one outlier to evaluate. Appendix A includes complete classification trees and scatterplot matrices for other chemicals and land use categories with greater than four outliers.

A summary of classification tree analysis for samples with greater than four outliers is provided in Table 5-16. Generally, relationships between an observation's status as an outlier and stormwater variables was weak to moderate. The variables and their influence on outliers did not demonstrate any apparent consistency between chemicals, location types, or land uses. Scatterplots of observations and stormwater variables did not reveal any apparent trends or discriminate between outliers and non-outliers in the current analysis.

Overall, these preliminary results indicate that it will be difficult to discern any consistent causes for stormwater outliers. Based on these results, we would not recommend the removal of any sample outliers based on some underlying observable likely cause. Thus, hypotheses such as, "small drainage areas generally yield unusual data" are unlikely to be identifiable using even fairly robust statistical analyses. This may be due to the overall inherent variability present in stormwater sampling results coupled with the power of the sample sizes available in this data set. Consequently, it also appears unlikely that, during the full analysis, we would recommend removal of any particular sample outliers from the overall data sets unless a more clear relationship between an outliers or outliers and underlying potential causes would be exhibited.

5.5 SUMMARY OF PRELIMINARY ANALYSIS AND RECOMMENDATIONS FOR FUTURE DATA ANALYSIS

Table 5-17 summarizes the results of the preliminary data analysis using the first round data showing the progression of sample numbers within each land use category for each step of the data analyses discussed in Sections 5.2 through 5.4. The table is easiest read by looking at a particular sampling location. For each of the steps of the analysis process (i.e., raw data, reclassified data, etc), the samples included in each land use category are shown.

As shown by the totals, for most chemicals a large number of samples were identified that could be moved from the Unique category to the Representative category. In addition, the removal of individual sample outliers diminished the total data sets in each category by between zero and eleven depending on the chemical. However, as noted previously, given that a clear cause for these individual sample outliers could not be established, we do not recommend duplicating this final outlier removal step in the future full analysis.

In general, the methods used in the analysis of the first round stormwater data set provide a robust and logical assessment. The primary source of uncertainty and limitation on the more quantitative statistical analyses was due to the limited number of samples for some chemicals and land use categories. In general, at least eight to ten observations should be available for the statistical analysis performed above.

The use of Dixon's and Rosner's test for outliers is generally acceptable, but only for data sets where the data distribution of the remaining data set is normally distributed. In most cases in the current analysis, that was not the case. Fortunately, visual observations tended to support the results of these tests, and widely differing conclusions on the number of outliers between visual and statistical tests was infrequent. However, more robust outlier tests that do not require the normality assumption of Dixon's and Rosner's tests may reduce uncertainty in the selection of outliers. More robust techniques are not available in ProUCL and would require an additional level of technical effort.

For the detailed outlier analysis, association of outliers with stormwater variables will be limited when there are fewer than approximately 10 outliers and less than approximately 30 observations total. In addition, for some stormwater variables the data set is not complete (i.e., baseflow). (Note base flow data were not available for the Port of Portland sites.) For cases where there are missing data, these cases are generally excluded from classification tree analysis, reducing the number of available cases to include in the analysis. For variables where the data is incomplete or does not meet a threshold for completeness, they should be considered for exclusion from outlier analysis. Additional work could be conducted to fill in some of the missing information for some stormwater variables. For example, baseflow data could be obtained for the Port of Portland locations. However, given the above observations about needed sample sizes and the limited findings of any relationships in the preliminary analysis, it is unlikely that filling in these variable data gaps would have a large impact on the findings. Consequently, we do not recommend extensive effort to fill in these stormwater variable data gaps.

5.6 NON-DETECT HANDLING

The method for non-detect handling involves evaluating the proportion of non-detects and then adjusting the non-detect data. These two steps are described in Sections 5.6.1 and 5.6.2.

It should be noted that although some of the previous preliminary analyses included a side-by-side analysis of the original and reclassified data sets, the non-detect preliminary analysis presented in this section presents an example evaluation of non-detects based on the reclassified data set. Similarly, although our recommendation above is to generally not exclude individual sample outliers (given that a cause for such outliers was not readily established), the example non-detect analysis in this section is conducted on the reclassified data with outliers removed.

5.6.1 Evaluate Proportion of Non-Detects

5.6.1.1 Method

Treatment of non-detect values will be based on sample size and the ratio of non-detects to detected values for each data group. The percentage of data points coming from non-detects, and the treatment of those non-detects, will always be clearly reported in all steps of the loading analysis.

The following rules were established by the Stormwater Technical Team for processing of non-detect data:

- Eliminate non-detect data values that are greater than two times the target detection limit for each analyte
- For all data sets with $n_{detected} > 8$, substitute non-detect values with extrapolated valued determined by robust regression on order statistics (ROS) using ProUCL
- For all data sets with $n_{detected} < 8$, substitute non-detect values with one-half the detection limit reported in the database

Total and dissolved stormwater sample data collected during the first round of sampling 2007 were evaluated for acenaphthene, arsenic, benzo(a)pyrene, lead, PCB-018, PCB-066, PCB-076, PCB-106, PCB-118, PCB-153, and PCB-194. TOC and TSS data were also evaluated. Data for each analyte were grouped according to the following land use categories: Representative heavy industrial, Unique heavy industrial, light industrial, heavy industrial/light industrial combined, open space, and residential. Note that although the multiple land use sites were not part of the reclassification and outlier analysis conducted in Sections 5.1 through 5.5 because they will not be directly used in loading estimate development, for this non-detect analysis, these sites were included.

The non-detect data evaluation was conducted on the final data set produced through the evaluation in Sections 5.1 through 5.5, which is the data set with duplicate outliers removed; reclassified across Unique heavy industrial, Representative heavy industrial, and Representative light industrial; and with sample outliers removed. Although a side-by-side analysis using the original classifications and the reclassified data was conducted in Sections 5.4 and 5.5, a non-detect evaluation for the original classifications was not conducted. This is because the primary purpose of the non-detect analysis was to provide an example of how non-detects would be handled once all other data processing is completed.

5.6.1.2 Example Using First Round Data

An initial data summary table was developed to summarize the percentage of non-detects for each chemical and land use category (Table 5-18) prior to non-detect processing (i.e., removal of high non-detects and ROS or one half detection limit substitution). This table was developed using a simple pivot table and mathematical formulas in MS Excel and contains sample counts and frequency of detection information for each chemical, organized by land use type following the reclassifications determined in the previous sections.

5.6.2 Adjustments for Non-Detect Data

5.6.2.1 Methods

Non-detect data values greater than two times the target detection limit for each analyte will be removed from the data set. Target detection limits will be taken from the FSP, Table 2-6b (Anchor and Integral 2007a), which are presented in Table 5-19. Non-detect data values will be compared to the target detection limits using a simple mathematical formula in MS Excel (example shown in Table 5-20).

Following removal of high non-detect values, a second data summary table will be developed to summarize the percentage of non-detects for each chemical and land use type (example shown in Table 5-21). For each analyte/land use type data set that contains non-detect values, the table will describe the proposed treatment of non-detect values based on frequency of detection:

- For all data sets with $n_{detected} > 8$, substitute non-detect values with extrapolated values determined by robust ROS using ProUCL
- For all data sets with $n_{detected} < 8$, substituted non-detect values with one-half the detection limit reported in the database.

For data sets that will receive ROS substitution, the complete (detected and non-detected) data sets will be imported into the ProUCL 4.0 statistical software package. The lognormal ROS substitution approach will be applied in ProUCL. This automatically generates extrapolated non-detect values based on an assumption that the non-detect values follow a lognormal distribution. (Note such an assumption is generally born out by examinations of the distributions in Sections 5.4 and 5.5. ProUCL automatically produces a new data set with detected values at their original concentration and new ROS extrapolated values for non-detect data.

5.6.2.2 Example Using First Round Data

A total of 56 non-detect values were flagged and removed from the data set for being greater than two times the detection limit, as summarized in Table 5-20. This is a relatively high number of sample points lost due to this rule. Consequently, it is recommended that for the future full analysis, an exploratory analysis will be conducted on the sensitivity of loading parameters to the treatment of non-detects so as to understand the degree to which non-detects influence loading estimates.

As shown on Table 5-21, based on sample size, two data sets were identified for ROS substitution for non-detects: total acenaphthene and total benzo(a)pyrene for the Representative heavy industrial land use type. Four data sets were identified for non-detect substitution with one half the detection limit: total acenaphthene and total benzo(a)pyrene for the open space and residential land use types. No other data sets contained non-detect values.

The final set of stormwater data following this example data analysis is included in Appendix A. In this table, all outliers and non-detect values greater than two times the target detection limit are excluded. Additionally, ROS and one half detection limit substitution for non-detect values has been applied in the appropriate cases. Table 5-22 summarizes sample counts and concentration ranges for the final data set. A data summary for all stormwater parameters is included in Table 5-23.

5.7 DEVELOPMENT OF SUMMARY STATISTICS

Once the data have been analyzed as described in Sections 5.1 through 5.6, a set of summary statistics will be developed for each chemical and each land use. A full range of potentially useful summary statistics will be produced such that evaluations of various types of loading estimate scenarios can be supported. Before any summary statistics are generated, the processed data will be tested for normality/log normality using tests previously described. Based on the data distributions appropriate central tendency estimates (e.g., mean, median) will be calculated, as well as confidence limits on those central tendencies (e.g., 5th percentile Lower Confidence Limits [LCL] and 95th percentile Upper Confidence Limits [UCL] on the mean). In general, to simplify reproducibility, ProUCL will be used to generate all desired summary statistics for each data set. Further, to support sensitivity analyses that may be conducted using loading estimates, the tails of the chemical concentration distributions will also be summarized (e.g., 95th percentile Upper Prediction Limits [UPL] and 5th percentile Lower Prediction Limits [LPL]).

5.8 FLOW VOLUME METHOD

Flow volumes will be calculated by the City of Portland Bureau of Environmental Services using the GRID model.

5.8.1 Description of GRID model

The GRID model (City of Portland 2006) is a GIS-based reconnaissance-level pollutant model developed by the City of Portland Bureau of Environmental Services to calculate stormwater runoff volumes and TSS loading rates. The GRID model will be used as a part of this stormwater loading calculations effort to provide flow volumes only.

Data compiled for each 100-foot by 100-foot grid includes precipitation, pervious/ impervious area, and zoning area (or land use). A map showing pervious/impervious area and land use is included in Appendix C. With these data, runoff volumes for various land use types are calculated using a series of equations known as the "Simple Method" developed by Schueler (1987).

The runoff volume calculation within the Simple Method is determined from:

$$R = P * Pj * Rv$$

Where:

R = Annual runoff per unit area (cm/month)

P = Annual rainfall (cm)

Pj = Fraction of monthly rainfall events that produce runoff (usually 0.9)

Rv = Runoff coefficient (unitless).

R will then be converted to units of volume/month (e.g., L/month) based on the depth (cm) of runoff times the area in (e.g., cm^2) in question.

5.8.2 Period for Analysis and Calibration/Validation Period

Five "typical" flow years (all starting September 1 of the year noted and ending August 31 of the following year) will be calculated using the GRID model. These years were selected to match the years planned to be run using the Hybrid Model during the RI/FS process (Anchor et al. 2007):

- 5^{th} Percentile Flow Year 2000 – mean flow 454 cubic meters per second (m^3/sec)
- 25^{th} Percentile Flow Year 1990 – mean flow 801 m^3/sec
- 50^{th} Percentile Flow Year 2002 – mean flow 863 m^3/sec
- 75^{th} Percentile Flow Year 2005 - mean flow 1,099 m^3/sec
- 95^{th} Percentile Flow Year 1996 – mean flow 1,522 m^3/sec

Additionally, two flow periods will be used for calibration and validation:

- September 1, 2004 through January 31, 2006 (17 months)
- September 1, 2006 through January 31, 2008 (17 months)

5.8.3 Monthly Flow Volumes

Volumes will be calculated on a monthly basis, because this is the smallest unit of time expected to require differentiation of loads for input to the Hybrid Model. It was generally chosen so seasonal variations in stormwater loads can be accounted for in the model, for example, where little if any stormwater loading would be expected in the summer months.

Monthly flow volumes will be calculated for each of the 5 years and the calibration/validation periods listed above in order to account for seasonal variations in stormwater flow. This means that 94 different months of stormwater volumes will be calculated.

Monthly flow volumes will be calculated by the City of Portland BES using the GRID model and provided by land use type and unique industrial site for each cell of the Hybrid Model as shown in Figure 4-2. Since it has not yet been determined which sites will be treated as Unique sites for stormwater loading purposes, volumes will be calculated for all individual industrial sites and basins. Once a site is determined to be a Unique site during the final data analysis, its flow volume can easily be subtracted from the general land use flow volume. Further discussion of calculations of flows is included in Appendix C.

The flow volumes to be calculated for each month using the GRID model are summarized in an example in Table 5-24.

5.9 LOAD CALCULATION

5.9.1 Monthly Loads

Monthly loads for each of the five precipitation years and the calibration/validation periods will be calculated by multiplying monthly flow volumes output from the GRID model by the selected statistical summary of chemical concentrations for each site or land use as discussed in Section 4.3.1. Loads will be calculated for each Hybrid Model shoreline cell based on the GRID model determined watersheds draining to the corresponding segment of shoreline. These values can then be input directly into the Hybrid Model for each shoreline cell. The monthly loads, likely summed over the entire Site on an annual basis, will also be used in the RI source, fate, and loading empirical analysis.

5.9.2 Load Scenarios

The range summary statistics summarized in Section 5.7 will be generated for each land use (or unique site) and each chemical. These values will be used to calculate separate loading "scenarios" for each chemical. The exact application of the loading scenarios has not been determined and will be part of the Hybrid Modeling exercises to support the various purposes in Section 2.2. Examples might include assessing recontamination assuming no new upland source controls are implemented. In this case, loading estimates based on the 95^{th} UCL concentrations might be appropriate. Similarly, a recontamination scenario might evaluate a 50 percent reduction in source loads due to various DEQ and other source control programs. In this case, 50 percent of the 95^{th} UCL concentrations might be used.

6.0 Sediment Trap-Based Loads

This section details the method for evaluating sediment trap data and using the data to calculate stormwater loads to the Site. A preliminary data analysis is not included as an example because sediment trap data are not yet available. The final data analysis using the methods presented in this section will be completed after all stormwater data have been validated and will be presented in a separate report.

6.1 TSS/TOC DATA

TSS data will be used to convert chemical concentrations measured in sediment to chemical loads to the Site as summarized in Section 4.3. TOC data will be used to normalize the sediment chemical concentration data and loads will be calculated using both TOC normalized and non-normalized data.

6.1.1 Data Sources

6.1.1.1 Use of TSS data from Stormwater Composite Samples

TSS measurements from the composite stormwater sampling conducted as part of the FSP and FSP Addendum sampling effort will be used. In most cases, sediment traps were installed at the same locations that stormwater samples were collected. Two exceptions to this are WR-4 Sulzer and the GE Decommissioning Facility, where there was no feasible location to install sediment traps.

For the most part, sediment traps were installed over the same sampling period as stormwater samples. However, in cases where sufficient stormwater samples were collected during the first round of sampling to meet FSP requirements, only sediment traps were installed for the second round of sampling and no composite stormwater samples were collected.

This necessarily means that there are some instances when the collection period for TSS data in stormwater does not completely match the collection period for sediment trap data. However, during conversations with the Stormwater Technical Team, it was decided that in cases where there was no stormwater TSS data collected during the second round of stormwater sampling, data from the first round of stormwater sampling will be used.

6.1.1.2 Comparison to Other Station/Site Data

TSS data available from studies other than the LWG stormwater composite sampling will be used only as a comparison to understand how typical or unusual study data may be. Two primary sources of additional TSS data are expected to be examined:

- TSS data collected at the same locations as the LWG sampling program for other purposes, such as DEQ source control evaluations.

- TSS data collected as part of the ACWA report that evaluated MS4 data in Oregon (Woodward Clyde 1997)

In each case the distributions and ranges of TSS data from these other sources will be compared to the LWG program TSS data. Site-specific data will be compared on a station-specific basis. General land use TSS data from the MS4 program will be compared to the distributions of TSS data available from similar pooled land use types based on the analysis of TSS carried out in Section 5. Where sufficient data exist, statistical comparative tests may be conducted and/or simple visual distribution comparisons similar to those in Section 5 will be conducted. Where LWG program TSS sample points appear to be substantial outliers as compared to other information, these sample points may be removed from the data set and/or the statistic on the data set used may account for the presence of the outlier. For example, if there are three samples and one is a high outlier, a median value rather than a mean value on the TSS data may be simply selected to minimize the impact of the high outlier.

6.1.2 TSS/TOC Summary Statistics

TSS/TOC data evaluated through the process in Section 5 will be used to generate similar summary statistics for sediment traps. These statistics will be by land use and for unique sites. Again, various TSS/TOC values may be used to represent various types of loading scenarios. Thus, a 95th UCL TSS may be used to represent a current source input situation, assuming no additional source controls are in place.

6.2 SEDIMENT TRAP DATA

Sediment trap data will be pooled by land use category listed in Table 4-1 and an outlier analysis by category/chemical similar to that described in Section 5.4 will be performed. In general there will be much fewer sediment trap data points than are available for stormwater. Consequently, most of the evaluations of sediment trap data will be confined to visual analyses of sediment trap distributions and identification of potential outliers based on professional judgment. In general, there will be a high bias toward including outliers in the analysis for two reasons. First, removal of a single data point will greatly diminish the available data set for each land use type. Second, sediment traps are intended to integrate stormwater concentrations over time and should be less susceptible to inherent variability in stormwater concentrations. Consequently, any potential outlier result is more likely to represent a reasonable range of conditions within that type of land use. Also, for unique sites, there is only one data point per location. Consequently, this value will be used almost regardless of the chemical concentrations present in the sample.

Normality/log normality will be tested for each land use pooled data set prior to calculating summary statistics. Similar to the discussion for stormwater in Section 5, a range of statistics will be calculated for each chemical within each land use category. These will be used to support various loading scenarios as noted in Section 5.

6.3 FLOW VOLUME METHODS

Flow volumes will be calculated and used for sediment trap loading estimates as described in Section 5.8.

6.4 LOAD CALCULATION

Sediment loading to the Site will be calculating using two different methods. The first method will use TSS data, while the second method will use TOC normalized data. The calculation based on both TSS and TOC approaches is summarized in Section 4.3.2. In each case, the chemical concentration in the sediment trap (either bulk sediment or on an OC-basis) is multiplied by either the TSS or TOC concentration in water, which is multiplied by the monthly flow volume. In either approach, the loads will be calculated based on a sediment trap chemical concentration statistic and TSS/TOC statistic that represents the pooled data sets (both chemical concentrations and TSS/TOC) for that land use. (Or in the case of unique sites, the single chemical concentration from that location and some statistic on the relatively small number of TSS/TOC values for that unique site.)

In this calculation it is important to recognize that statistics used for the chemical concentration as well as the TSS/TOC should be selected on a consistent basis. Thus, if the 95th percentile UCL is used for chemical concentration, a similar statistic should be used for the TSS/TOC concentration. Also, care should be taken when using extreme values from either distribution because of the multiplicative effect in the loading equation. Thus, taking a maximum TSS concentration and a maximum chemical concentration from a land use category data set may represent a situation that is very unlikely to occur, particularly given that these two maximums are unlikely to occur at the same sampling location. For this reason, the calculation of loads from sediment traps should be biased toward more central tendency estimates and use of combined 95th percentile UPL values (or similar) for chemical and TSS/TOC values should be avoided.

7.0 Calculation Comparisons

The stormwater sampling program provides for two different ways to compare stormwater loading results: comparison of extrapolated loads to measured loads and comparison of stormwater loading concentrations to sediment trap loading calculations.

As discussed in Section 4.3, this report includes methods for calculating stormwater loads using both whole water chemistry samples (stormwater samples) and suspended sediment chemistry samples (sediment trap samples).

7.1 COMPARISON EXTRAPOLATED TO MEASURED LOADS

As discussed previously in Section 4.2.3, there are three basins that will be used as an independent verification of extrapolated loads to calibrate the extrapolated load methods and determine uncertainties in the overall approach. These basins include:

- OF-18 is an estimated 410-acre basin containing industrial, residential, open space and major transportation (Hwy 30) land use.
- OF-19 is a 492-acre basin containing industrial, open space, heavy transportation land use.
- Yeon Mixed Use is an 18-acre sub-basin that drains to the river at OF-18. This basin includes 4.6 acres of major transportation (highway) land use and 13 acres of industrial land use

Extrapolated loads for each of these basins will be calculated using generalized stormwater loading criteria for each land use developed from the stormwater data. For example, the stormwater loading for one month in the Yeon Mixed Use basin could be calculated in two ways:

- Stormwater loading using measured concentrations:

$$L_{\text{Yeon Mixed Use}} = C_w \text{ x } V_{\text{month}}$$

Where:
L = Load (µg/month)

C_w = Measured concentration (µg/L) for Yeon Mixed Use

V_{month} = Volume of discharge from land use or site over a month

- Stormwater loading using extrapolated data

$$L_{\text{Yeon Mixed Use}} = (C_w \text{ x } V_{\text{month}})_{\text{heavy industrial}} + (C_w \text{ x } V_{\text{month}})_{\text{industrial land use}}$$

Where:
L = Load (µg/month)

C_w = Concentration (µg/L) for particular land use

V_{month} = Volume of discharge from land use over a month

If the use of representative land use data to calculate loads for unsampled similar areas is valid, theoretically, the extrapolated loads and measured loads should be similar. The extent to which these two values differ is a measure of many potential variables and assumptions that occur in these calculations. As such, it will not be possible based on this evaluation to pinpoint the source of any differences observed. However, it does provide an overall measure of the level of uncertainty associated with the approach. This in turn will have bearing on the range of statistical values that should be used in the loading calculations. For example, if the two methods (calculated consistently) result in load estimates that vary by 100 percent, then any loading estimate used in the Hybrid Model or in the RI evaluations should be varied by at least that amount to understand the uncertainties within a particular assessed scenario. Thus, a recontamination modeling scenario intended to mimic current source conditions should probably be varied plus or minus 100 percent to determine how it impacts recontamination conclusions regarding current sources.

7.2 COMPARISON OF STORMWATER CONCENTRATIONS TO SEDIMENT TRAP CONCENTRATIONS

Similar to the comparison noted in the previous section, stormwater based loads can be compared to sediment trap loads for the same land use or location. However, unlike the above comparison, it would not be expected that stormwater and sediment trap results would be the same because each method has some intrinsic measurement artifacts that will lead to varying load estimates. Comparisons between results of one sediment trap and another are inherently uncertain given that the flow regime and trap configuration is different at each outfall. There is similar uncertainty in the collection of stormwater samples as the collection methodology can affect the TSS component on the sample.

Another reason for expected variation between loads from the two measurements is that total (unfiltered) stormwater concentrations include both dissolved and particulate concentrations. Conversely, sediment trap concentrations represent chemicals associated with particulates in stormwater. This divergence between loads estimated the two ways would be expected to be greater for less hydrophobic chemicals such as metals. Consequently, for metals data, stormwater loads will be calculated using both dissolved and total metals measurements. In addition, the total concentrations minus dissolved concentrations will be used to estimate the particulate metal load indicated by the stormwater data. The calculated particulate load in stormwater will be compared to the sediment trap loads to see if they are similar. Additionally, sediment trap loads will be compared to the total composite water loads. In this comparison, the sediment trap loads would be expected to be lower than total composite water loads if all other measurement variables in the study are inconsequential (an unlikely but useful assumption for the purposes of the comparison). To the extent that particulate loads in stormwater and sediment traps differ, or for example, sediment trap loads are higher than total stormwater loads, this will be used as 1) indicators of study uncertainty and 2) to help determine what other measurement variables may be contributing to these unexpected results.

Note that dissolved stormwater composite data are not available for organic compounds. Consequently, the above data analysis will not be conducted for these organic compounds. However, the grab stormwater data include filtered and unfiltered concentrations for all the study organic compounds for one grab event at select sites. These limited grab data will be reviewed to determine whether there are indications that other organic compounds have a substantial dissolved component, and this will help further gauge the uncertainty associated with sediment trap loading estimates (which focus on particulate loads) for these compounds.

Per the SSR, by using two approaches, the advantages and disadvantages of each method can be better understood and the two loading estimates compared to provide a better overall sense of the potential range of chemical loads. The SSR discusses these advantages and disadvantages in detail, and a comparison to the two types of loading estimate may highlight which of these are most important.

However, it is not expected that differences between the two methods will be used to “reject” the use of one type of loading estimate. Rather, an evaluation similar to the extrapolated and measured loads above will be used, where any loading scenario evaluated will be varied over the range of uncertainty indicated by the differences between stormwater and sediment trap based loads.

8.0 Schedule for Review and Implementation

This report will be submitted to EPA for review in May of 2008 and approval by early June 2008 in time for the expected database lockdown completion on June 1, 2008. If needed, EPA and the Stormwater Technical Team will meet in early June to discuss the methods presented in this report and potential EPA comments on this report. Through this discussion, it is hoped that a general agreement between EPA and LWG on any variations on the approach in this report can be determined.

Once the database lockdown is completed, assuming it happens as scheduled on June 1, the entire data set will be combined and analyzed in accordance with the methods presented in this report or as agreed to in discussions with EPA. GRID model volume calculations and chemical concentration data processing will occur simultaneously in June. Loading calculations from the volumes and concentration data will take place approximately in July. Hybrid Modeling and RI evaluations will then proceed approximately in August.

The final loading calculations and data analysis using the methods presented in this report will be presented in the RI Report in an appendix supporting the source, fate, and transport analysis.

9.0 References

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Tables

Table 3-1. Analytes Measured from Stormwater Samples*

Outfall(s)	Facility or Location	Land Use	TSS	TOC	DOC (filtered)	Total Metals	Diss. Metals (filtered)	PAHs	Phthalates	PCB Congeners	Herbicides	Organo-chlorine Pesticides
Unique Industrial Locations (11)												
WR-22	OSM	Heavy Industrial	X	X	X	X	X	X	X	X	X	
WR-123	Schnitzer International Slip	Heavy Industrial	X	X	X	X	X	X	X	X	X	
WR-384	Schnitzer - Riverside	Heavy Industrial	X	X	X	X	X	X		X	X	
WR-107	GASCO	Heavy Industrial	X	X	X	X	X	X		X	X	
WR-96	Arkema	Heavy Industrial	X	X	X	X	X	X	X	X	X	X
WR-14	Chevron - Transportation	Heavy Industrial	X	X	X	X	X	X		X	X	
WR-161	Portland Shipyard	Heavy Industrial	X	X	X	X	X	X	X	X	X	
WR-4	Sulzer Pump	Heavy Industrial	X	X	X	X	X	X		X	X	
WR-145/142	Gunderson	Heavy Industrial	X	X	X	X	X	X	X	X	X	
WR-147	Gunderson (former Schnitzer)	Heavy Industrial	X	X	X	X	X	X	X	X	X	
Drains to OF-17	GE Decommissioning	Heavy Industrial	X	X	X	X	X	X	X	X		
WR-183/Basin R[T4]	Terminal 4 - Slip 1	Heavy Industrial	X	X	X	X	X	X	X	X		X
WR-181/Basin Q[T4]	Terminal 4 - Slip 1	Heavy Industrial	X	X	X	X	X	X	X	X		X
WR-177/Basin M[T4]	Terminal 4 - Slip 1	Heavy Industrial	X	X	X	X	X	X	X	X		X
WR-20/Basin L[T4]	Terminal 4 - Wheeler Bay	Heavy Industrial	X	X	X	X	X	X	X	X		X
Land Use Locations (12)												
WR-67	Siltronic	Heavy Industrial	X	X	X	X	X	X		X	X	
OF-22B	City - Doane Lake Industrial Area	Heavy Industrial[2]	X	X	X	X	X	X		X	X	X
OF-22	City - Willbridge Industrial Area	Heavy Industrial	X	X	X	X	X	X		X	X	
OF-16	City - Heavy Industrial	Heavy Industrial	X	X	X	X	X	X		X	X	
WR-218	UPRR Albina	Heavy Industrial	X	X	X	X	X	X		X	X	
OF-M1, above Devine	City - Mocks Bottom Industrial Area	Light Industrial	X	X	X	X	X	X		X	X	
OF-M2	City - Mocks Bottom Industrial Area	Light Industrial	X	X	X	X	X	X	X	X	X	
OF-52C/Basin T[T4]	City - Terminal 4 Industrial Area	Light Industrial	X	X	X	X	X	X	X	X		X
WR-169/Basin D[T4]	Terminal 4 (Toyota)	Light Industrial	X	X	X	X	X	X	X	X		
Hwy 30 "A"	Hwy 30	Major Transportation	X	X	X	X	X	X		X	X	
Hwy 30 "B"[1]	Hwy 30	Major Transportation	X	X	X	X	X	X		X	X	
St. Johns Bridge	Highway drainage	Major Transportation[3]	X	X	X	X	X	X	X	X	X	
OF-22C	City - Forest Park Area	Open Space (Forest Park)	X	X	X	X	X	X	X	X	X	
OF-49	City - St. Johns Area	Residential	X	X	X	X	X	X	X	X	X	
OF-53[T4]	City - Residential above Terminal 4	Residential	X	X	X	X	X	X	X	X		X
Multiple Land Use Locations (3)												
OF-18	City - Multiple Land Uses	Open Space/Heavy Industrial	X	X	X	X	X	X	X	X	X	
OF-19	City - Multiple Land Uses	Open Space/Heavy Industrial	X	X	X	X	X	X		X	X	
Yeon Mixed Use [4]	City - Multiple Land Uses	Major Transportation/Light Industrial	X	X	X	X	X	X		X	X	

Notes:

*An X means that the analyte was measured at least once during the stormwater sampling period, and in most cases three or more times. For more specific information on number of samples collected at each sample location, see the FSR.

1 - The runoff sampled at this location drains to the sanitary sewer overflow bypass tunnel constructed in 2006 and no longer drains to the river.

2 - The runoff from this site is assumed to be a unique site for pesticides as discussed with the Stormwater Technical Team.

3 - This site was originally planned to be a site representative of heavy transportation. However, preliminary observations by the stormwater technical team have discussed changing this site to a unique site due to the fact that the bridge was painted recently

4 - This site was originally intended to measure Hwy 30 runoff only, however, as discussed in the FSR, the sampling equipment was installed a location where additional drainage from NW 35th was sampled. In order to avoid confusion, this site has been renamed.

T4- Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 3-2. Analytes Measured from Sediment Traps with Detection Limit Factors.*

Outfall(s)	Facility or Location	Land Use	PCB Congeners	TOC	Percent Solids	Organo-chlorine Pesticides	PAHs and Phthalates	Metals	Herbicides
Unique Industrial Locations (11)									
WR-22	OSM	Heavy Industrial	1	1	1	1	1	1	1.3
WR-123	Schnitzer International Slip	Heavy Industrial	1	1	1	1	1	1	1
WR-384	Schnitzer - Riverside	Heavy Industrial	1	1	1	1	1	1	1
WR-107	GASCO	Heavy Industrial	1	1	1	1	1	1	1
WR-96	Arkema	Heavy Industrial	No Measurable Sediment Collected						
WR-14	Chevron - Transportation	Heavy Industrial	1	1	1	1	1	1	1
WR-161	Portland Shipyard	Heavy Industrial	1	1	1	1	1	1	1.4
WR-4	Sulzer Pump	Heavy Industrial	No Sediment Traps Installed						
WR-145/142	Gunderson	Heavy Industrial	1.1	1	1				
WR-147	Gunderson (former Schnitzer)	Heavy Industrial	1	1	1	1	2		
Drains to OF-17	GE Decommissioning	Heavy Industrial	No Sediment Traps Installed						
WR-183/Basin R[T4]	Terminal 4 - Slip 1	Heavy Industrial	1						
WR-181/Basin Q[T4]	Terminal 4 - Slip 1	Heavy Industrial	No Sediment Traps Installed						
WR-177/Basin M[T4]	Terminal 4 - Slip 1	Heavy Industrial	1	1	1	1	1	1	
WR-20/Basin L[T4]	Terminal 4 - Wheeler Bay	Heavy Industrial	1	1	1	1	1	1	
Land Use Locations (12)									
WR-67	Siltronic	Heavy Industrial	1	1	1	4.8			
OF-22B	City - Doane Lake Industrial Area	Heavy Industrial[2]	1.5	1	1	1	1.5	1	
OF-22	City - Willbridge Industrial Area	Heavy Industrial	1.3	1	1				
OF-16	City - Heavy Industrial	Heavy Industrial	1	1	1	1	1.2		
WR-218	UPRR Albina	Heavy Industrial	1	1	1	1	1	1	1
OF-M1, above Devine	City - Mocks Bottom Industrial Area	Light Industrial	1	1	1	1	1.6		
OF-M2	City - Mocks Bottom Industrial Area	Light Industrial	1	1	1	1	1.6		
OF-52C/Basin T[T4]	City - Terminal 4 Industrial Area	Light Industrial	1	1	1	1	1	1	
WR-169/Basin D[T4]	Terminal 4 (Toyota)	Light Industrial	1	1	1		1 (PAHs only)	1	
Hwy 30 "A"	Hwy 30	Major Transportation	1.4	1	1				
Hwy 30 "B"[1]	Hwy 30	Major Transportation	1	1	1	1	1	1	1
St. Johns Bridge	Highway drainage	Major Transportation[3]	1	1	1	1	2.4		
OF-22C	City - Forest Park Area	Open Space (Forest Park)	1	1	1	1	1	1	1
OF-49	City - St. Johns Area	Residential	1	1	1	1	1.8	1	
OF-53[T4]	City - Residential above Terminal 4	Residential	1	1	1	1	1	1	
Multiple Land Use Locations (3)									
OF-18	City - Multiple Land Uses	Open Space/Heavy Industrial	1	1	1	1	1	1	1
OF-19	City - Multiple Land Uses	Open Space/Heavy Industrial	1	1	1	1	1	1	1
Yeon Mixed Use [4]	City - Multiple Land Uses	Major Transportation/Heavy Industrial	1.8	1	1				

Notes:

*Detection limit factor shows how the target detection limit (DL) will be exceeded with the sample mass remaining. A factor of 1 means the target detection limit will be achieved. A factor of 2 means the actual DL will be two times higher than the target DL. Detection Limits are estimated since results of laboratory analysis have not been received.

1 - The runoff sampled at this location drains to the sanitary sewer overflow bypass tunnel constructed in 2006 and no long drains to the river.

2 - The runoff from this site is assumed to be a unique site for pesticides as discussed with the Stormwater Technical Team.

3 - This site was originally planned to be a site representative of heavy transportation. However, preliminary observations by the stormwater technical team have discussed changing this site to a unique site due to the fact that the bridge was painted recently.

4 - This site was originally intended to measure Hwy 30 runoff only, however, as discussed in the FSR, the sampling equipment was installed a location where additional drainage from NW 35th was sampled. In order to aviod confusion, this site has been ren

T4- Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 4-1. Stormwater and Sediment Trap Sampling Locations.

Outfall(s)	Facility or Location	River Mile	Land Use	Industrial or Land Use Activities
Unique Industrial Locations (11)				
WR-22	OSM	2.1	Heavy Industrial	Steel manufacturing
WR-123	Schnitzer International Slip	3.7	Heavy Industrial	Metals
WR-384	Schnitzer - Riverside	4	Heavy Industrial	Metals
WR-107	GASCO	6.4	Heavy Industrial	MGP
WR-96	Arkema	7.3	Heavy Industrial	Chemical manufacturing
WR-14	Chevron - Transportation	7.7	Heavy Industrial	Bulk Fuel
WR-161	Portland Shipyard	8.2	Heavy Industrial	Ship maintenance and repair
WR-4	Sulzer Pump	10.4	Heavy Industrial	Manufacturing
WR-145/142	Gunderson	8.9	Heavy Industrial	Barge and railroad car manufacturing
WR-147	Gunderson (former Schnitzer)	9	Heavy Industrial	Metals handling
Drains to OF-17	GE Decommissioning	9.7	Heavy Industrial	Transformer decommissioning
WR-183/Basin R[T4]	Terminal 4 - Slip 1	4.3	Heavy Industrial	Grains storage/transport
WR-181/Basin Q[T4]	Terminal 4 - Slip 1	4.3	Heavy Industrial	Vacant/former grain storage
WR-177/Basin M[T4]	Terminal 4 - Slip 1	4.3	Heavy Industrial	Car parking/liquid bulk storage
WR-20/Basin L[T4]	Terminal 4 - Wheeler Bay	4.5	Heavy Industrial	Kinder Morgan bulk storage
Land Use Locations (12)				
WR-67	Siltronic	6.6	Heavy Industrial	Silicon wafer manufacturing
OF-22B	City - Doane Lake Industrial Area	6.9	Heavy Industrial[2]	Chemical manufacturing
OF-22	City - Willbridge Industrial Area	7.7	Heavy Industrial	Petroleum/Forest Park drainage
OF-16	City - Heavy Industrial	9.7	Heavy Industrial	Mixed industrial/highway
WR-218	UPRR Albina	10	Heavy Industrial	Railyard
OF-M1, above Devine	City - Mocks Bottom Industrial Area	Lagoon	Light Industrial	Various light industrial uses
OF-M2	City - Mocks Bottom Industrial Area	Lagoon	Light Industrial	Trucking and distribution
OF-52C/Basin T[T4]	City - Terminal 4 Industrial Area	4.3	Light Industrial	Mixed industrial
WR-169/Basin D[T4]	Terminal 4 (Toyota)	4.7	Light Industrial	Vacant/former petroleum storage
Hwy 30 "A"	Hwy 30	9.7	Major Transportation	Highways
Hwy 30 "B"	Hwy 30	n/a[1]	Major Transportation	Highways
St. Johns Bridge	Highway drainage	5.8	Major Transportation[3]	Highways
OF-22C	City - Forest Park Area	6.9	Open Space (Forest Park)	Forest land
OF-49	City - St. Johns Area	6.5	Residential	Local traffic/residential
OF-53[T4]	City - Residential above Terminal 4	5.1	Residential	Local traffic/residential

Table 4-1. Stormwater and Sediment Trap Sampling Locations.

Outfall(s)	Facility or Location	River Mile	Land Use	Industrial or Land Use Activities
Multiple Land Use Locations (3)				
OF-18	City - Multiple Land Uses	9.7	Open Space/Heavy Industrial	Also includes highway
OF-19	City - Multiple Land Uses	8.4	Open Space/Heavy Industrial	Also includes highway
Yeon Mixed Use [4]	City - Multiple Land Uses	9.7	Major Transportation/Heavy Industrial	Highways, streets, light industrial

Notes:
1 - The runoff sampled at this location drains to the sanitary sewer overflow bypass tunnel constructed in 2006 and no long drains to the river.
2 - The runoff from this site is assumed to be a unique site for pesticides as discussed with the Stormwater Technical Team.
3 - This site was originally planned to be a site representative of heavy transportation. However, preliminary observations by the stormwater technical team have discussed changing this site to a unique site due to the fact that the bridge was painted recently and some residual may exist.
4 - This site was originally intended to measure Hwy 30 runoff only, however, as discussed in the FSR, the sampling equipment was installed a location where additional drainage from NW 35th was sampled. In order to aviod confusion, this site has been renamed
T4- Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-1. Records Peremptorily Excluded.

River Reach	Location Name	Sample Date	X	Y	River Mile	sys_sample_code	parent_sample_code	Type	Exclude Station	Reason
Upper Study Area 1	H30[1]	39181	7633771.3	694111.5	9.1	LW3-STW-CW10-H30	LW3-STW-CW10-H30	N	-1	Includes > 50% Light Industrial
Middle ISA	SJB	39167	7621535.5	707015.9	5.7	LW3-STW-CW10-SJB	LW3-STW-CW10-SJB	N	-1	Presence of bridge paint
Upper ISA	WR4	39167	7639792.8	692452.2	10.3	LW3-STW-CW10-WR04D	LW3-STW-CW10-WR04	LD	-1	Wrong basin
Upper ISA	WR4	39167	7639792.8	692452.2	10.3	LW3-STW-CW10-WR04	LW3-STW-CW10-WR04	N	-1	Wrong basin
Upper Study Area 1	H30[1]	39205	7633771.3	694111.5	9.1	LW3-STW-CW20-H30	LW3-STW-CW20-H30	N	-1	Includes > 50% Light Industrial
Middle ISA	SJB	39181	7621535.5	707015.9	5.7	LW3-STW-CW20-SJB	LW3-STW-CW20-SJB	N	-1	Presence of bridge paint
Upper ISA	WR4	39181	7639792.8	692452.2	10.3	LW3-STW-CW20-WR4	LW3-STW-CW20-WR4	N	-1	Wrong basin
Upper Study Area 1	H30[1]	39243	7633771.3	694111.5	9.1	LW3-STW-CW30-H30D	LW3-STW-CW30-H30	LD	-1	Includes > 50% Light Industrial
Upper Study Area 1	H30[1]	39243	7633771.3	694111.5	9.1	LW3-STW-CW30-H30	LW3-STW-CW30-H30	N	-1	Includes > 50% Light Industrial
Middle ISA	SJB	39190	7621535.5	707015.9	5.7	LW3-STW-CW30-SJB	LW3-STW-CW30-SJB	N	-1	Presence of bridge paint
Middle ISA	SJB	39190	7621535.5	707015.9	5.7	LW3-STW-CW30-SJB DISS	LW3-STW-CW30-SJB	N	-1	Presence of bridge paint
Upper ISA	WR4	39190	7639792.8	692452.2	10.3	LW3-STW-CW30-WR4-2	LW3-STW-CW30-WR4	FD	-1	Wrong basin
Upper ISA	WR4	39190	7639792.8	692452.2	10.3	LW3-STW-CW30-WR4	LW3-STW-CW30-WR4	N	-1	Wrong basin
Upper ISA	WR4	39190	7639792.8	692452.2	10.3	LW3-STW-CW30-WR4-2DISS	LW3-STW-CW30-WR4	FD	-1	Wrong basin
Upper ISA	WR4	39190	7639792.8	692452.2	10.3	LW3-STW-CW30-WR4DISS	LW3-STW-CW30-WR4	N	-1	Wrong basin
Middle ISA	SJB	39195	7621535.5	707015.9	5.7	LW3-STW-CW40-SJB	LW3-STW-CW40-SJB	N	-1	Presence of bridge paint
Upper ISA	WR4	39205	7639792.8	692452.2	10.3	LW3-STW-CW40-WR4-2	LW3-STW-CW40-WR4	FD	-1	Wrong basin
Upper ISA	WR4	39205	7639792.8	692452.2	10.3	LW3-STW-CW40-WR4	LW3-STW-CW40-WR4	N	-1	Wrong basin
Middle ISA	SJB	39205	7621535.5	707015.9	5.7	LW3-STW-CW50-SJB	LW3-STW-CW50-SJB	N	-1	Presence of bridge paint
Middle ISA	SJB	39243	7621535.5	707015.9	5.7	LW3-STW-CW60-SJBD	LW3-STW-CW60-SJB	LD	-1	Presence of bridge paint
Middle ISA	SJB	39243	7621535.5	707015.9	5.7	LW3-STW-CW60-SJB	LW3-STW-CW60-SJB	N	-1	Presence of bridge paint

Note:
1 - This site was originally intended to measure Hwy 30 runoff only, however, as discussed in the FSR, the sampling equipment was installed a location where additional drainage from NW 35th was sampled. In order to avoid confusion, this site has been renamed Yeon Mixed Use.

Table 5-2. Chemical Names and Their Coded Equivalent.

Parameter	**Fraction**	**Units**	**Data Label**
Total organic carbon	NA	mg/L	TOC
Total suspended solids	NA	mg/L	TSS
Arsenic	dissolved	µg/L	As_D
Arsenic	total	µg/L	As_T
Lead	dissolved	µg/L	Pb_D
Lead	total	µg/L	Pb_T
Acenaphthene	dissolved	µg/L	ACE_D
Acenaphthene	total	µg/L	ACE_T
Benzo(a)pyrene	dissolved	µg/L	BAP_D
Benzo(a)pyrene	total	µg/L	BAP_T
PCB018	dissolved	pg/L	PCB018_D
PCB018	total	pg/L	PCB018_T
PCB066 & 076	dissolved	pg/L	PCB066_D
PCB066 & 076	total	pg/L	PCB066_T
PCB106 & 118	dissolved	pg/L	PCB106_D
PCB106 & 118	total	pg/L	PCB106_T
PCB153	dissolved	pg/L	PCB153_D
PCB153	total	pg/L	PCB153_T
PCB194	dissolved	pg/L	PCB194_D
PCB194	total	pg/L	PCB194_T

Table 5-3. Field Heading Descriptors.

Field Name	Data Type	Description
RiverReach	Text	RiverReach
LocationName	Text	LocationName
Original Land Use	Text	Original Land Use Classification based on the stormwater sampling rationale
LUC	Number	Land Use Classification numbering scheme based on Original Land Use Classification Field: 1=Heavy Industrial; 2=Light Industrial; 3=Open Space; 4=Open Space/Heavy Industrial; 5=Residential; 6=Transportation
RevLUC	Number	Reclassified LUC based on Task 4 analysis; Same number structure as LUC with one addtional classification: 1.5=Heavy Industrial/Light Industrial
Location Type	Text	Original Location Type based on stormwater sampling rationale: Unique, Representative, Mulitple Land Use
LocTypeCode	Number	Location Type numbering scheme based on Original Location Code Field: 1=Unique, 2=Representative, 3=Multiple
RevLocTypeCode	Number	Reclassified LocTypeCode based on Task 4 analysis; Same number structure as LocTypeCode
SampleDate	Number	Sample Date
CollectionType	Text	Comp=Composite sample; Grab=Grab sample
parent_sample_code	Text	Parent sys_sample_code; See Table Sample Type for sys_sample_code prefixes that were removed
systat_samp	Text	Temporary
Result	Number	Analytical Result
D_Result	Number	Numerical flag for identifying detects and nondetects: 1=Detect, 0=Nondetect; See Qualifiers Table for explanation
ChemID	Text	Abbreviated COPC name; See Units and Fractions Table for explanation
Units	Text	See Units and Fractions Table for explanation
drainage	Number	Previous Header: Site Drainage Size (acres)
surface	Number	Previous Header: Impervious Surface Area %
stormcond	Number	Previous Header: Antecedant Storm Conditions (days without more than 01inches of
rainfall	Number	Previous Header: Rainfall Amount (001 inch)

Table 5-3. Field Heading Descriptors.

Field Name	**Data Type**	**Description**
hdyrograph	Number	Previous Header: Percent of hydrograph sampled
baseflow	Number	Previous Header: % baseflow versus stormwater runoff
nonstormwaterdischarge	Number	Previous Header: Non-Stormwater Discharges
Orig_Outlier	Yes/No	YES=Result was identified in Task 5 Analysis as an outlier for specific LUC/LocTypeCode/ChemID based on original data set
Rev_Outlier	Yes/No	YES=Result was identified in Task 5 Analysis as an outlier for specific RevLUC/RevLocTypeCode/ChemID based on reclassification of data set in Task 4
StormCorr_Original	Yes/No	YES=Outlier analysis in Task 5 demonstrated a signfiicant and/or apparent relationship between presence of outliers and stormwater variables for LUC/LocTypeCode/ChemID based on original data set
StormCorr_Reclassified	Yes/No	YES=Outlier analysis in Task 5 demonstrated a signfiicant and/or apparent relationship between presence of outliers and stormwater variables for LUC/LocTypeCode/ChemID based on reclassified data set

Table 5-4. Samples Included in Duplicate Analysis.

Duplicate Sample ID	Normal Sample ID	ChemID
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	ACE_T
LW3-STW-CW10-OF22C-2	LW3-STW-CW10-OF22C	ACE_T
LW3-STW-CW20-OF19-2	LW3-STW-CW20-OF19	ACE_T
LW3-STW-CW20-OF22C-2	LW3-STW-CW20-OF22C	ACE_T
LW3-STW-CW40-OFM2-2	LW3-STW-CW40-OFM2	ACE_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	As_D
LW3-STW-CW30-WR4-2DISS	LW3-STW-CW30-WR4	As_D
LW3-STW-CW40-WR4-2	LW3-STW-CW40-WR4	As_D
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	As_T
LW3-STW-CW20-OF19-2	LW3-STW-CW20-OF19	As_T
LW3-STW-CW30-OFM2-2	LW3-STW-CW30-OFM2	As_T
LW3-STW-CW30-WR4-2	LW3-STW-CW30-WR4	As_T
LW3-STW-CW40-WR4-2	LW3-STW-CW40-WR4	As_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	BAP_T
LW3-STW-CW10-OF22C-2	LW3-STW-CW10-OF22C	BAP_T
LW3-STW-CW20-OF19-2	LW3-STW-CW20-OF19	BAP_T
LW3-STW-CW40-OFM2-2	LW3-STW-CW40-OFM2	BAP_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	Pb_D
LW3-STW-CW30-WR4-2DISS	LW3-STW-CW30-WR4	Pb_D
LW3-STW-CW40-WR4-2	LW3-STW-CW40-WR4	Pb_D
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	Pb_T
LW3-STW-CW20-OF19-2	LW3-STW-CW20-OF19	Pb_T
LW3-STW-CW30-OFM2-2	LW3-STW-CW30-OFM2	Pb_T
LW3-STW-CW30-WR4-2	LW3-STW-CW30-WR4	Pb_T
LW3-STW-CW40-WR4-2	LW3-STW-CW40-WR4	Pb_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	PCB018_T
LW3-STW-CW10-OF22C-2	LW3-STW-CW10-OF22C	PCB018_T
LW3-STW-CW20-OF22C-2	LW3-STW-CW20-OF22C	PCB018_T
LW3-STW-CW40-OFM2-2	LW3-STW-CW40-OFM2	PCB018_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	PCB066_T
LW3-STW-CW10-OF22C-2	LW3-STW-CW10-OF22C	PCB066_T
LW3-STW-CW20-OF22C-2	LW3-STW-CW20-OF22C	PCB066_T
LW3-STW-CW40-OFM2-2	LW3-STW-CW40-OFM2	PCB066_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	PCB106_T
LW3-STW-CW10-OF22C-2	LW3-STW-CW10-OF22C	PCB106_T
LW3-STW-CW20-OF22C-2	LW3-STW-CW20-OF22C	PCB106_T
LW3-STW-CW40-OFM2-2	LW3-STW-CW40-OFM2	PCB106_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	PCB153_T
LW3-STW-CW10-OF22C-2	LW3-STW-CW10-OF22C	PCB153_T
LW3-STW-CW20-OF22C-2	LW3-STW-CW20-OF22C	PCB153_T
LW3-STW-CW40-OFM2-2	LW3-STW-CW40-OFM2	PCB153_T
LW3-STW-CW10-OF18-2	LW3-STW-CW10-OF18	PCB194_T

Table 5-4. Samples Included in Duplicate Analysis.

Duplicate Sample ID	Normal Sample ID	ChemID
LW3-STW-CW10-OF22C-2	LW3-STW-CW10-OF22C	PCB194_T
LW3-STW-CW20-OF22C-2	LW3-STW-CW20-OF22C	PCB194_T
LW3-STW-CW40-OFM2-2	LW3-STW-CW40-OFM2	PCB194_T
LW3-STW-CW10-OFM1-2	LW3-STW-CW10-OFM1	TOC
LW3-STW-CW20-OF19-2	LW3-STW-CW20-OF19	TOC
LW3-STW-CW20-OF49-2	LW3-STW-CW20-OF49	TOC
LW3-STW-CW30-WR4-2	LW3-STW-CW30-WR4	TOC
LW3-STW-CW40-WR4-2	LW3-STW-CW40-WR4	TOC
LW3-STW-CW10-OFM1-2	LW3-STW-CW10-OFM1	TSS
LW3-STW-CW20-OF19-2	LW3-STW-CW20-OF19	TSS
LW3-STW-CW20-OF49-2	LW3-STW-CW20-OF49	TSS
LW3-STW-CW30-WR4-2	LW3-STW-CW30-WR4	TSS
LW3-STW-CW40-WR4-2	LW3-STW-CW40-WR4	TSS

Table 5-5. Coefficient of Variation for Normal and Duplicate Results.

Chemical	Sample				
	LW3-STW-CW10-OF18	**LW3-STW-CW10-OF22C**	**LW3-STW-CW20-OF22C**	**LW3-STW-CW40-OFM2**	
PCB018_T	37.0	5.7	2.4	5.5	
PCB066_T	62.9	5.7	2.4	20.7	
PCB106_T	100.9	72.0	41.0	16.0	
PCB153_T	83.7	10.6	2.4	17.8	
PCB194_T	94.3	5.7	2.4	19.1	

Chemical	Sample				
	LW3-STW-CW10-OFM1	**LW3-STW-CW20-OF19**	**LW3-STW-CW20-OF49**	**LW3-STW-CW30-WR4**	**LW3-STW-CW40-WR4**
TOC	0.0	4.0	1.2	1.6	2.4
TSS	8.7	12.6	0.0	0.0	9.4

Chemical	Sample				
	LW3-STW-CW10-OF18	**LW3-STW-CW10-OF22C**	**LW3-STW-CW20-OF19**	**LW3-STW-CW20-OF22C**	**LW3-STW-CW40-OFM2**
ACE_T	12.9	2.2	21.1	0.0	19.4
BAP_T	23.6	1.6	16.6		0.0

Chemical	Sample				
	LW3-STW-CW10-OF18	**LW3-STW-CW20-OF19**	**LW3-STW-CW30-OFM2**	**LW3-STW-CW30-WR4**	**LW3-STW-CW40-WR4**
As_D	5.5			1.2	1.4
As_T	14.5	1.2	25.2	2.4	0.7
Pb_D	6.1			2.2	2.4
Pb_T	36.9	11.3	6.4	0.1	0.5

Table 5-6. Divergent Normal and Duplicate Results.

sys_sample_code	ChemID	Result	Detected	Units
LW3-STW-CW10-OF18	PCB153_T	21100	Yes	ppt
LW3-STW-CW10-OF18-2	PCB153_T	5410	Yes	ppt
LW3-STW-CW10-OF18	PCB194_T	5450	Yes	ppt
LW3-STW-CW10-OF18-2	PCB194_T	1090	Yes	ppt
LW3-STW-CW10-OF18	Pb_T	76.3	Yes	ppm
LW3-STW-CW10-OF18-2	Pb_T	44.7	Yes	ppm

Table 5-7. GOF Tests for Each Analyte.

Chemical	Fraction	Distribution - All Samples		
		Normal[a]	**Gamma[b]**	**Lognormal[a]**
Acenaphthylene	Total	No	No	Yes
Arsenic	Dissolved	No	Yes	Yes
Arsenic	Total	No	Yes	Yes
Benzo(a)pyrene	Total	No	No	No
Lead	Dissolved	No	No	Yes
Lead	Total	No	No	Yes
PCB-018	Total	No	Yes	Yes
PCB-066	Total	No	No	Yes
PCB-106	Total	No	Yes	Yes
PCB-153	Total	No	Yes	Yes
PCB-194	Total	No	Yes	Yes
TOC		No	No	Yes
TSS		No	No	Yes

Notes
a - Shapiro-Wilk test at a=0.05
b - Kolmorogov-Smirnov test at a=0.05

Table 5-8. Candidate Outliers.

Land Use	Location Type	Classification[a]	ChemID	N	Distribution[b]	Outliers				
						Visual (Normal)[c]	Visual (Log)[d]	Statistical[e]	Valid Result[f]	Number of Outliers[g]
Heavy Industrial	Representative	Original	ACE_T		Lognormal	1	1	1	TRUE	1
Heavy Industrial	Representative	Original	As_D		Lognormal	12	12	0	FALSE	12
Heavy Industrial	Representative	Original	As_T		Lognormal	12	12	12	TRUE	12
Heavy Industrial	Representative	Original	BAP_T		None	6	6	8	TRUE	8
Heavy Industrial	Representative	Original	Pb_D		Lognormal	6	0	6	TRUE	6
Heavy Industrial	Representative	Original	Pb_T		Lognormal	5	5	5	TRUE	5
Heavy Industrial	Representative	Original	PCB018_T		Lognormal	4	4	4	FALSE	4
Heavy Industrial	Representative	Original	PCB066_T		Lognormal	3	3	3	FALSE	3
Heavy Industrial	Representative	Original	PCB106_T		Lognormal	4	3	3	FALSE	3
Heavy Industrial	Representative	Original	PCB153_T		Lognormal	5	5	3	FALSE	5
Heavy Industrial	Representative	Original	PCB194_T		Lognormal	4	4	1	FALSE	4
Heavy Industrial	Representative	Original	TOC		Lognormal	4	4	3	FALSE	4
Heavy Industrial	Representative	Original	TSS		Lognormal	1	1	1	FALSE	1

Notes
a - Original -- Classification prior to Task 4 analysis; Preliminary revised -- Revised classification based on Task 4 analysis
b - Distribution based on ProUCL goodness of fit tests (ND=1/2 DL)
c - Normal distribution plots
d - Lognormal distribution plots
e - Dixon's (N<25) or Rosner's Test (N>=25)
f - Valid Statistical Outlier -- If dataset normally distributed with outliers removed, Valid Test = TRUE; else Valid Test=FALSE
g - Decision Rule:
If number of visual(normal), visual(log), and statistical outliers (a=0.05) all equaled X; Then X outliers were identified; ELSE
If removing X outliers identified using statistical tests resulted in a normal distribution (i.e. Valid Result = TRUE) of the remaining results, then X outliers identified; ELSE
If removing X outliers identified using visual(normal) plots resulted in a normal distribution of the remaining results, then X outliers identified; ELSE
X outliers identifed using visual(log) plots were identified

Table 5-9. Sample and Outlier Status by Chemical Specific Basis
Location Type: Representative
Land Use: Heavy Industrial

ChemID	WR-20[T4]			WR-177[T4]				WR-181[T4]	
	WLCT4C07BsnL070324	WLCT4C07BsnL070503	WLCT4C07BsnL070520	WLCT4C07BsnM070324	WLCT4C07BsnM070407	WLCT4C07BsnM070503	WLCT4C07BsnM070520	WLCT4C07BsnQ070324	WLCT4C07BsnQ070407
ACE_T	NO	NO	NO	**YES**	NO	NO	--	NO	NO
As_D	**YES**	NO	**YES**	**YES**	--	**YES**	**YES**	NO	--
As_T	NO	NO	**YES**	**YES**	--	**YES**	**YES**	NO	--
BAP_T	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	--	**YES**	NO
Pb_D	NO	NO	NO	NO	--	NO	NO	NO	--
Pb_T	NO	NO	NO	**YES**	--	NO	NO	NO	--
PCB018_T	NO	NO	**YES**	NO	NO	NO	--	NO	NO
PCB066_T	NO	NO	**YES**	NO	NO	NO	--	NO	NO
PCB106_T	NO	NO	NO	NO	**YES**	**YES**	--	NO	NO
PCB153_T	NO	NO	NO	NO	**YES**	**YES**	--	NO	NO
PCB194_T	NO	NO	NO	NO	NO	NO	--	NO	NO
TOC	NO	NO	NO	NO	NO	NO	--	NO	NO
TSS	NO	NO	NO	NO	NO	NO	--	NO	NO

Note:
NO: Observation was not identified as a potential outlier
YES: Observation was flagged as a potential outlier
T4: Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-9. Sample and Outlier Status by Chemical Specific Basis
Location Type: Representative
Land Use: Heavy Industrial

ChemID	WR-183[T4]				OF16				
	WLCT4C07BsnR070324	WLCT4C07BsnR070407	WLCT4C07BsnR070503	WLCT4C07BsnR070520	LW3-STW-CW10-OF16	LW3-STW-CW20-OF16	LW3-STW-CW30-OF16	LW3-STW-CW40-OF16	LW3-STW-CW50-OF16
ACE_T	NO	NO	NO	--	NO	NO	NO	--	--
As_D	NO	--	**YES**	**YES**	--	NO	--	NO	**YES**
As_T	NO	--	**YES**	**YES**	NO	NO	NO	NO	NO
BAP_T	NO	NO	**YES**	--	NO	NO	NO	--	--
Pb_D	NO	--	**YES**	**YES**	--	**YES**	--	**YES**	NO
Pb_T	NO	--	**YES**	**YES**	NO	NO	NO	NO	NO
PCB018_T	NO	NO	**YES**	--	NO	**YES**	NO	--	--
PCB066_T	NO	NO	**YES**	--	NO	NO	NO	--	--
PCB106_T	NO	NO	**YES**	--	NO	NO	NO	--	--
PCB153_T	NO	NO	**YES**	--	NO	**YES**	NO	--	--
PCB194_T	NO	NO	**YES**	--	NO	**YES**	NO	--	--
TOC	**YES**	**YES**	**YES**	--	NO	NO	NO	NO	--
TSS	NO	NO	**YES**	--	NO	NO	NO	NO	NO

Note:
NO: Observation was not identified as a potential outlier
YES: Observation was flagged as a potential outlier
T4: Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-9. Sample and Outlier Status by Chemical Specific Basis
Location Type: Representative
Land Use: Heavy Industrial

ChemID	OF22			OF22B		WR218	
	LW3-STW-CW10-OF22	**LW3-STW-CW20-OF22**	**LW3-STW-CW30-OF22**	**LW3-STW-CW10-OF22B**	**LW3-STW-CW20-OF22B**	**LW3-STW-CW10-WR218**	**LW3-STW-CW20-WR218**
ACE_T	NO	NO	NO	NO	NO	NO	NO
As_D	--	**YES**	**YES**	**YES**	**YES**	NO	NO
As_T	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	NO
BAP_T	NO	NO	NO	NO	NO	NO	NO
Pb_D	--	NO	NO	**YES**	**YES**	NO	NO
Pb_T	NO	NO	NO	**YES**	**YES**	NO	NO
PCB018_T	NO	NO	NO	NO	**YES**	NO	NO
PCB066_T	NO	NO	NO	NO	**YES**	NO	NO
PCB106_T	NO	NO	NO	NO	NO	NO	NO
PCB153_T	NO	NO	NO	NO	**YES**	NO	NO
PCB194_T	NO	NO	NO	**YES**	**YES**	NO	NO
TOC	NO	NO	NO	NO	**YES**	NO	NO
TSS	NO	NO	NO	NO	NO	NO	NO

Note:
NO: Observation was not identified as a potential outlier
YES: Observation was flagged as a potential outlier
T4: Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-9. Sample and Outlier Status by Chemical Specific Basis
Location Type: Representative
Land Use: Heavy Industrial

ChemID	WR67					
	LW3-STW-CW10-WR67	LW3-STW-CW20-WR67	LW3-STW-CW30-WR67	LW3-STW-CW40-WR67	LW3-STW-CW50-WR67	LW3-STW-CW60-WR67
ACE_T	NO	NO	NO	--	--	NO
As_D	--	NO	NO	--	NO	NO
As_T	NO	NO	NO	--	NO	NO
BAP_T	NO	NO	NO	--	--	NO
Pb_D	--	NO	NO	--	NO	NO
Pb_T	NO	NO	NO	--	NO	NO
PCB018_T	NO	NO	NO	NO	--	NO
PCB066_T	NO	NO	NO	NO	--	NO
PCB106_T	NO	NO	NO	NO	--	NO
PCB153_T	NO	NO	NO	NO	--	NO
PCB194_T	NO	NO	NO	NO	--	NO
TOC	NO	NO	NO	NO	NO	NO
TSS	NO	NO	NO	NO	NO	NO

Note:
NO: Observation was not identified as a potential outlier
YES: Observation was flagged as a potential outlier
T4: Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-10. Locations Recommended for Reclassification as Unique Heavy Industrial.

COPC[a]	Location Name[b]					
	WR-20[T4]	**WR-177[T4]**	**WR-183[T4]**	**OF16**	**OF22**	**OF22B**
Arsenic, dissolved	x	x	x		x	x
Arsenic, Total		x	x		x	x
Benzo(a)pyrene, total	x					
Lead, dissolved			x	x		x
Lead, total			x			x
PCB-106, total		x				
PCB-153, total		x				
PCB-194, total						x
TOC			x			x

Note
a - Only COPC with at least one reclassified Location Name listed
b - Only Location Names proposed for reclassification for at least one COPC listed
T4 - Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-11. Summary of Unique Heavy Industrial Sites Analysis.

Chemical	Original Classification[a]						Reclassified Data[b]					
	Upper-tail Divergence (Statistical)[1]	Upper-tail Divergence (Graphical)[2]	Midrange Divergence (Statistical)[3]	Removing selected samples Removes Divergence?	Samples/ Locations Removed	Reclassify Unique Locations as Representative	Upper-tail Divergence (Statistical)[1]	Upper-tail Divergence (Graphical)[2]	Midrange Divergence (Statistical)[3]	Removing selected samples Removes Divergence	Samples/ Locations Removed	Reclassify Unique Locations as Representative
Acenaphthylene, total	No	No	No			Yes	No	No	No	NDF		Yes
Arsenic, dissolved	No	No	No			No	Yes	Yes	NR	No		No
Arsenic, total	Yes	Yes	No	No		No	No	Yes	Yes	No		No
Benzo(a)pyrene, total	No	No	No			Yes	No	No	No	NDF		Yes
Lead, dissolved	Yes	Yes	No	No		No	Yes	Yes	NR	No		No
Lead, total	No	No	No			Yes	Yes	Yes	NR	Yes	WR183 WR384	Yes
PCB-018, total	No	No	No			Yes	No	No	No	NDF		Yes
PCB-066, total	No	No	No			Yes	No	No	No	NDF		Yes
PCB-106, total	No	No	No			Yes	No	No	No	NDF		Yes
PCB-153, total	Yes	No	No	Yes	WR384	Yes	No	Yes	Yes	No		No
PCB-194, total	Yes	No	No	No		No	Yes	Yes	NR	No		No
TOC	No	No	No			Yes	Yes	Yes	NR	Yes	WR183	Yes
TSS	No	No	No			Yes	No	No	No	NDF		Yes

Notes

a - Based on Land Use and Location Type as identified in the FSP
b - Base on reclassified Land Use and Location Type conducted in Task 4E and 4F
1 - Based on Quantile Test; Ho: Heavy Industrial <= Light Industrial (a=0.05)
2 - Based on QQ plots and Box plots; Lognormal Scale
3 - Based on WMW or Gehan’s Test; Ho: Heavy Industrial <= Light Industrial (a=0.05)
NDF - No Divergence Found
NR - Midrange divergence test not run because upper-tail divergence detected.

Table 5-12. Results of Light Industrial versus Heavy Industrial Sites Analysis.

Chemical	Original Classification[a]			Combine Heavy Industrial and Light Industrial?	Reclassified Data[b]			Combine Heavy Industrial and Light Industrial?
	Upper-tail Divergence (Statistical)[1]	Upper-tail Divergence (Graphic)[2]	Midrange Divergence (Statistical)[3]		Upper-tail Divergence (Statistical)[1]	Upper-tail Divergence (Graphic)[2]	Midrange Divergence (Statistical)[3]	
Acenaphthylene, total	No	Yes	Yes	No	No	Yes	Yes	No
Arsenic, dissolved	Yes	Yes	NR	No	Yes	No	NR	No
Arsenic, total	Yes	Yes	NR	No	No	No	No	Yes
Benzo(a)pyrene, total	Yes	Yes	NR	No	Yes	Yes	NR	No
Lead, dissolved	No	Yes	No	No	No	No	No	Yes
Lead, total	Yes	Yes	NR	No	No	No	No	Yes
PCB-018, total	No	No	No	Yes	No	No	No	Yes
PCB-066, total	No	Yes	No	No	No	No	No	Yes
PCB-106, total	No	Yes	No	No	No	No	Yes	No
PCB-153, total	No	Yes	Yes	No	No	Yes	Yes	No
PCB-194, total	No	Yes	Yes	No	No	Yes	No	Yes
TOC	Yes	Yes	NR	No	Yes	Yes	NR	No
TSS	Yes	Yes	NR	No	Yes	Yes	NR	No

Notes:

* Not included in analysis

a - Based on Land Use and Location Type as identified in the FSP

b - Base on reclassified Land Use and Location Type conducted in Task 4E and 4F

1 - Based on Quantile Test; Ho: Heavy Industrial <= Light Industrial (a=0.05)

2 - Based on QQ plots and Box plots; Lognormal Scale

3 - Based on WMW or Gehan's Test; Ho: Heavy Industrial <= Light Industrial (a=0.05)

NR - Midrange divergence test not run because upper-tail divergence detected.

Table 5-13. Results of Outlier Analysis Using Original Data.

Land Use	Location Type	Classification[a]	ChemID	N	Distribution[b]	Outliers Visual (Normal)[c]	Visual (Log)[d]	Statistical[e]	Valid Result[f]	Number of Outliers[h]
Heavy Industrial	Representative	Original	ACE_T	25	Lognormal	1	1	1	TRUE	1
Heavy Industrial	Representative	Original	As_D	23	Lognormal	5	5	0	FALSE	5
Heavy Industrial	Representative	Original	As_T	27	Lognormal	2	2	12	TRUE	12
Heavy Industrial	Representative	Original	BAP_T	25	None	6	6	8	TRUE	8
Heavy Industrial	Representative	Original	Pb_D	23	Lognormal	6	0	6	TRUE	6
Heavy Industrial	Representative	Original	Pb_T	27	Lognormal	5	5	5	TRUE	5
Heavy Industrial	Representative	Original	PCB018_T	26	Lognormal	4	4	4	FALSE	4
Heavy Industrial	Representative	Original	PCB066_T	26	Lognormal	3	3	3	FALSE	3
Heavy Industrial	Representative	Original	PCB106_T	26	Lognormal	4	3	3	FALSE	3
Heavy Industrial	Representative	Original	PCB153_T	26	Lognormal	5	5	3	FALSE	5
Heavy Industrial	Representative	Original	PCB194_T	26	Lognormal	5	1	1	FALSE	1
Heavy Industrial	Representative	Original	TOC	28	Lognormal	4	4	3	FALSE	4
Heavy Industrial	Representative	Original	TSS	29	Lognormal	1	1	1	FALSE	1
Heavy Industrial	Unique	Original	ACE_T	26	None	3	3	3	TRUE	3
Heavy Industrial	Unique	Original	As_D	23	None	3	3	0	TRUE	3
Heavy Industrial	Unique	Original	As_T	36	None	9	9	11	FALSE	9
Heavy Industrial	Unique	Original	BAP_T	25	None	7	7	7	FALSE	7
Heavy Industrial	Unique	Original	Pb_D	23	NA	9	9	0	FALSE	9
Heavy Industrial	Unique	Original	Pb_T	36	Lognormal	5	3	13	TRUE	13
Heavy Industrial	Unique	Original	PCB018_T	25	Lognormal	3	3	10	FALSE	3
Heavy Industrial	Unique	Original	PCB066_T	25	Lognormal	3	3	9	FALSE	3
Heavy Industrial	Unique	Original	PCB106_T	25	None	4	4	4	FALSE	4
Heavy Industrial	Unique	Original	PCB153_T	25	None	4	5	4	FALSE	5
Heavy Industrial	Unique	Original	PCB194_T	25	NA	7	3	7	FALSE	3
Heavy Industrial	Unique	Original	TOC	38	Lognormal	10	10	10	TRUE	10
Heavy Industrial	Unique	Original	TSS	38	Lognormal	6	6	13	TRUE	6
Light Industrial	Representative	Original	ACE_T	13	Lognormal	4	4	4	TRUE	4
Light Industrial	Representative	Original	As_D	11	Normal	2	2	0	TRUE	0
Light Industrial	Representative	Original	As_T	14	Normal	3	3	0	TRUE	0
Light Industrial	Representative	Original	BAP_T	13	Normal	1	1	1	TRUE	1
Light Industrial	Representative	Original	Pb_D	11	Normal	2	2	2	TRUE	2
Light Industrial	Representative	Original	Pb_T	14	Lognormal	8	8	0	FALSE	8
Light Industrial	Representative	Original	PCB018_T	10	Lognormal	2	0	2	FALSE	0
Light Industrial	Representative	Original	PCB066_T	10	Lognormal	3	0	3	FALSE	3
Light Industrial	Representative	Original	PCB106_T	10	Lognormal	3	3	3	FALSE	3
Light Industrial	Representative	Original	PCB153_T	10	Lognormal	2	2	3	TRUE	3
Light Industrial	Representative	Original	PCB194_T	10	Lognormal	3	1	1	TRUE	1
Light Industrial	Representative	Original	TOC	14	Normal	0	0	0	TRUE	0
Light Industrial	Representative	Original	TSS	14	Normal	0	0	0	TRUE	0
Open Space	Representative	Original	ACE_T	2	--	--	--	--	--	--
Open Space	Representative	Original	As_D	1	--	--	--	--	--	--
Open Space	Representative	Original	As_T	2	--	--	--	--	--	--
Open Space	Representative	Original	BAP_T	1	--	--	--	--	--	--
Open Space	Representative	Original	Pb_D	1	--	--	--	--	--	--
Open Space	Representative	Original	Pb_T	2	--	--	--	--	--	--
Open Space	Representative	Original	PCB018_T	2	--	--	--	--	--	--

Table 5-13. Results of Outlier Analysis Using Original Data.

Land Use	Location Type	Classification[a]	ChemID	N	Distribution[b]	Outliers				
						Visual (Normal)[c]	Visual (Log)[d]	Statistical[e]	Valid Result[f]	Number of Outliers[h]
Open Space	Representative	Original	PCB066_T	2	--	--	--	--	--	--
Open Space	Representative	Original	PCB106_T	2	--	--	--	--	--	--
Open Space	Representative	Original	PCB153_T	2	--	--	--	--	--	--
Open Space	Representative	Original	PCB194_T	2	--	--	--	--	--	--
Open Space	Representative	Original	TOC	2	--	--	--	--	--	--
Open Space	Representative	Original	TSS	2	--	--	--	--	--	--
Open Space/Heavy Industrial	Multiple	Original	ACE_T	7	Normal	0	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	As_D	6	Normal	0	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	As_T	8	Normal	0	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	BAP_T	7	Normal	0	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	Pb_D	6	Normal	2	2	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	Pb_T	8	Normal	0	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	PCB018_T	7	Normal	1	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	PCB066_T	7	Normal	2	0	1	TRUE	1
Open Space/Heavy Industrial	Multiple	Original	PCB106_T	7	Normal	1	1	1	TRUE	1
Open Space/Heavy Industrial	Multiple	Original	PCB153_T	6	Normal	0	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	PCB194_T	6	Normal	0	0	0	TRUE	0
Open Space/Heavy Industrial	Multiple	Original	TOC	10	Normal	1	1	1	TRUE	1
Open Space/Heavy Industrial	Multiple	Original	TSS	10	Normal	0	0	0	TRUE	0
Residential	Representative	Original	ACE_T	6	--	--	--	--	--	--
Residential	Representative	Original	As_D	3	--	--	--	--	--	--
Residential	Representative	Original	As_T	5	Normal	1	1	1	TRUE	1
Residential	Representative	Original	BAP_T	6	Normal	1	0	1	TRUE	1
Residential	Representative	Original	Pb_D	3	--	--	--	--	--	--
Residential	Representative	Original	Pb_T	5	Lognormal	2	2	2	TRUE	2
Residential	Representative	Original	PCB018_T	5	Normal	0	0	0	TRUE	0
Residential	Representative	Original	PCB066_T	5	Normal	0	0	0	TRUE	0
Residential	Representative	Original	PCB106_T	5	Normal	0	0	0	TRUE	0
Residential	Representative	Original	PCB153_T	5	Normal	0	0	0	TRUE	0
Residential	Representative	Original	PCB194_T	5	Normal	0	0	0	TRUE	0
Residential	Representative	Original	TOC	6	Normal	0	0	0	TRUE	0
Residential	Representative	Original	TSS	6	Normal	0	0	0	TRUE	0

Notes
a - Original -- Classification prior to Task 4 analysis; Preliminary revised -- Revised classification based on Task 4 analysis
b - Distribution based on ProUCL goodness of fit tests (ND=1/2 DL)
c - Normal distribution plots
d - Lognormal distribution plots
e - Dixon's (N<25) or Rosner's Test (N>=25)
f - Valid Statistical Outlier -- If dataset normally distributed with outliers removed, Valid Test = TRUE; else Valid Test=FALSE
g - Potential outlier on lower-tail
h - Decision Rule:
If number of visual(normal), visual(log), and statistical outliers (a=0.05) all equaled X; Then X outliers were identified; ELSE
If removing X outliers identified using statistical tests resulted in a normal distribution (i.e. Valid Result = TRUE) of the remaining results, then X outliers identified; ELSE
If removing X outliers identified using visual(normal) plots resulted in a normal distribution of the remaining results, then X outliers identified; ELSE
X outliers identifed using visual(log) plots were identified
'--' - Insufficient number of detections for GOF tests using ProUCL; removed from additional analysis

Table 5-14. Results of Outlier Analysis Using Reclassified Data.

Land Use	Location Type	Classification[a]	ChemID	N	Distribution[b]	Outliers				
						Visual (Normal)[c]	Visual (Log)[d]	Statistical[e]	Valid Result[f]	Number of Outliers[h]
Heavy Industrial	Unique	Reclassified	As_D	33	NONE	3	3	3	NO	3
Heavy Industrial	Unique	Reclassified	As_T	44	LOG	11	11	8	NO	11
Heavy Industrial	Unique	Reclassified	BAP_T	6	--	--	--	--	--	--
Heavy Industrial	Unique	Reclassified	Pb_D	31	LOG	8	0	8	NO	0
Heavy Industrial	Unique	Reclassified	Pb_T	9	LOG	2	0	2	YES	0
Heavy Industrial	Unique	Reclassified	PCB106_T	3	--	--	--	--	--	--
Heavy Industrial	Unique	Reclassified	PCB153_T	3	--	--	--	--	--	--
Heavy Industrial	Unique	Reclassified	PCB194_T	27	LOG	7	0	7	NO	0
Heavy Industrial	Unique	Reclassified	TOC	3	--	--	--	--	--	--
Heavy Industrial	Representative	Reclassified	ACE_T	51	NONE	8	4	4	YES	4
Heavy Industrial	Representative	Reclassified	As_D	13	LOG	1	1	1	YES	1
Heavy Industrial	Representative	Reclassified	BAP_T	44	LOG	9	9	9	YES	9
Heavy Industrial	Representative	Reclassified	PCB106_T	48	LOG	5	5	8	NO	5
Heavy Industrial	Representative	Reclassified	PCB153_T	48	LOG	6	6	10	NO	6
Heavy Industrial	Representative	Reclassified	TOC	63	LOG	11	11	2	NO	11
Heavy Industrial	Representative	Reclassified	TSS	67	LOG	2	2	2	NO	2
Heavy/Light Industrial	Representative	Reclassified	As_T	33	LOG	7	2	2	NO	2
Heavy/Light Industrial	Representative	Reclassified	Pb_T	68	LOG	5	5	3	NO	5
Heavy/Light Industrial	Representative	Reclassified	PCB018_T	61	LOG	6	6	>31	NO	0
Heavy/Light Industrial	Representative	Reclassified	PCB066_T	61	LOG	4	4	10	NO	4
Heavy/Light Industrial	Representative	Reclassified	PCB194_T	34	LOG	1	1	1	NO	1

Notes:

a - Original -- Classification prior to Task 4 analysis; Preliminary revised -- Revised classification based on Task 4 analysis

b - Distribution based on ProUCL goodness of fit tests (ND=1/2 DL)

c - Normal distribution plots

d - Lognormal distribution plots

e - Dixon's (N<25) or Rosner's Test (N>=25)

f - Valid Statistical Outlier -- If dataset normally distributed with outliers removed, Valid Test = TRUE; else Valid Test=FALSE

g - Potential outlier on lower-tail

h - Decision Rule:

If number of visual(normal), visual(log), and statistical outliers (a=0.05) all equaled X; Then X outliers were identified; ELSE

If removing X outliers identified using statistical tests resulted in a normal distribution (i.e. Valid Result = TRUE) of the remaining results, then X outliers identified; ELSE

If removing X outliers identified using visual(normal) plots resulted in a normal distribution of the remaining results, then X outliers identified; ELSE

X outliers identifed using visual(log) plots were identified

'--' - Insufficient number of detections for GOF tests using ProUCL; removed from additional analysis

Table 5-15. Summary of Stormwater Statistics.

			Variable Name:	**DRAINAGE**	**SURFACE**	**STORMCOND**	**RAINFALL**	**HYDROGRAPH**	**BASEFLOW**		
Outfall(s)	**Facility or Location**	**Sample Event ID**	**Date Retrieved**	**Site Drainage Size (acres)**	**Impervious Surface Area %**	**Antecedant Storm Conditions (days without more than 0.1 inches of rain)**	**Rainfall Amount (100th of inch)**	**% of hydrograph measured**	**% baseflow versus stormwater runoff**	**Possible Non-Stormwater Discharges**	**"Other" events**
WR-22	OSM	LW3-STW-CW10-WR22	26-Mar-07	18.3	62%	3.6	94	100%	34%	Groundwater Infiltration	
		LW3-STW-CW20-WR22	9-Apr-07	18.3	62%	6.5	48	100%	40%		
		LW3-STW-CW30-WR22	18-Apr-07	18.3	62%	2.1	33	87%	61%		
		LW3-STW-CW40-WR22	3-May-07	18.3	62%	10.2	31	100%	57%		
WR-123	Schnitzer International Slip	LW3-STW-CW10-WR123	9-Apr-07	76	80%	6.5	48	100%	13%		
		LW3-STW-CW20-WR123	18-Apr-07	76	80%	2.1	33	80%	36%		
		LW3-STW-CW30-WR123	23-Apr-07	76	80%	2.6	25	100%	15%		
		LW3-STW-CW40-WR123	3-May-07	76	80%	10.2	31	100%	27%		
		LW3-STW-CW50-WR123	11-Jun-07	76	80%	1.7	29	100%	12%		
WR-384	Schnitzer - Riverside	LW3-STW-CW10-WR384	9-Apr-07	10.25	90%	6.5	48	100%	0%		
		LW3-STW-CW20-WR384	18-Apr-07	10.25	90%	2.1	33	100%	0%	Maybe	
		LW3-STW-CW30-WR384	23-Apr-07	10.25	90%	2.6	25	100%	0%		
		LW3-STW-CW40-WR384	3-May-07	10.25	90%	10.2	31	100%	0%		
		LW3-STW-CW50-WR384	11-Jun-07	10.25	90%	1.7	29	100%	0%		
WR-107	GASCO	LW3-STW-CW10-WR107	26-Mar-07	8	50%	3.4	106	81%	0%	Groundwater and process water	
		LW3-STW-CW20-WR107	9-Apr-07	8	50%	6.5	47	100%	0%		
		LW3-STW-CW30-WR107	18-Apr-07	8	50%	2.2	30	100%	0%		
		LW3-STW-CW40-WR107	3-May-07	8	50%	9.4	38	100%	0%		
WR-96	Arkema	LW3-STW-CW10-WR96	26-Mar-07	1.88	82%	3.4	106	75%	0%		
		LW3-STW-CW20-WR96	23-Apr-07	1.88	82%	2.4	26	100%	0%		
		LW3-STW-CW30-WR96	3-May-07	1.88	82%	9.4	38	100%	0%		
		LW3-STW-CW40-WR96	10-Jun-07	1.88	82%	2.1	39	100%	0%		
WR-14	Chevron - Transportation	LW3-STW-CW10-WR14	26-Mar-07	1.15	100%	3.6	118	100%	0%	Possible non-stormwater discharge…non-contact cooling water or something? (Noticeable intermittent non-stormwater flow)	
		LW3-STW-CW20-WR14	9-Apr-07	1.15	100%	5.6	52	90%	0%		
		LW3-STW-CW30-WR14	23-Apr-07	1.15	100%	1.9	27	100%	0%		
		LW3-STW-CW40-WR14	3-May-07	1.15	100%	9.7	56	100%	0%		
		LW3-STW-CW50-WR14	10-Jun-07	1.15	100%	2.2	30	100%	0%		
WR-161	Portland Shipyard	LW3-STW-CW10-WR161	26-Mar-07	4.8	100%	3.5	124	69%	0%		
		LW3-STW-CW20-WR161	9-Apr-07	4.8	100%	6.5	58	94%	0%		
		LW3-STW-CW30-WR161	3-May-07	4.8	100%	9.3	61	86%	0%		
		LW3-STW-CW40-WR161	10-Jun-07	4.8	100%	2	31	100%	0%		
WR-145	Gunderson	LW3-STW-CW10-WR145	9-Apr-07	0.25	100%	5.6	52	50%	0%		
WR-142*	Gunderson	LW3-STW-CW10-WR142	10-Jun-07	0.25	100%	2.2	30	100%	0%		

Table 5-15. Summary of Stormwater Statistics.

			Variable Name:	DRAINAGE	SURFACE	STORMCOND	RAINFALL	HYDROGRAPH	BASEFLOW		
Outfall(s)	**Facility or Location**	**Sample Event ID**	**Date Retrieved**	**Site Drainage Size (acres)**	**Impervious Surface Area %**	**Antecedant Storm Conditions (days without more than 0.1 inches of rain)**	**Rainfall Amount (100th of inch)**	**% of hydrograph measured**	**% baseflow versus stormwater runoff**	**Possible Non-Stormwater Discharges**	**"Other" events**
WR-147	Gunderson	LW3-STW-CW10-WR147	9-Apr-07	5	100%	5.6	52	100%	0%		
		LW3-STW-CW20-WR147	18-Apr-07	5	100%	1.8	33	100%	0%		
		LW3-STW-CW30-WR147	23-Apr-07	5	100%	1.9	27	100%	0%		
		LW3-STW-CW40-WR147	3-May-07	5	100%	9.7	56	100%	0%		
		LW3-STW-CW50-WR147	10-Jun-07	5	100%	2.2	30	100%	0%		
WR-183[T4]	T4		24-Mar-07	15	20%	3.0	29	97%			
			7-Apr-07	15	20%	12.7	48	88%			
			1-May-07	15	20%	10.2	44	57%			
			20-May-07	15	20%	15.6	23	75%			
			16-Nov-07	15	20%	2.8	77	56%			
WR-181[T4]	T4		7-Apr-07	18	60%	12.7	48	19%			
			28-Sep-07	18	60%	38.4	47	100%			
WR-177[T4]	T4		24-Mar-07	29.1	56%	3.0	29	95%			
			7-Apr-07	29.1	56%	12.7	48	73%			
			1-May-07	29.1	56%	10.2	44	70%			
			20-May-07	29.1	56%	15.6	23	97%			
			28-Sep-07	29.1	56%	38.4	47	93%			
WR-20[T4]	T4		24-Mar-07	17.2	22%	3.0	29	56%			
			1-May-07	17.2	22%	10.2	44	68%			
			20-May-07	17.2	22%	15.6	23	95%		Maybe	
			28-Sep-07	17.2	22%	38.4	47	93%		Maybe	
OF-49	City - St. Johns Area	LW3-STW-CW10-OF49	9-Apr-07	44.4	30%	6.5	47	100%	0%		
		LW3-STW-CW20-OF49	23-Apr-07	44.4	30%	2.4	26	60%	0%		
		LW3-STW-CW30-OF49	9-Jun-07	44.4	30%	2.1	39	100%	0%		
WR-67	Siltronic	LW3-STW-CW10-WR67	9-Apr-07	14	100%	6.5	47	79%	0%		
		LW3-STW-CW20-WR67	9-Apr-07	14	100%	1	27	100%	0%		
		LW3-STW-CW30-WR67	18-Apr-07	14	100%	2.2	30	64%	0%		
		LW3-STW-CW40-WR67	23-Apr-07	14	100%	2.4	26	100%	0%		
		LW3-STW-CW50-WR67	3-May-07	14	100%	9.4	38	100%	0%		
		LW3-STW-CW60-WR67	10-Jun-07	14	100%	2.1	39	100%	0%		
OF-22C	City - Above Hwy 30, Forest Park Area	LW3-STW-CW10-OF22C	18-Apr-07	969	10%	2.2	30	100%	?	Forest Park Streams	
		LW3-STW-CW20-OF22C	23-Apr-07	969	10%	2.4	26	100%	?		
OF-22B	City - Doane Lake Industrial Area	LW3-STW-CW10-OF22B	26-Mar-07	30.38	100%	3.4	106	100%	32%	Groundwater Infiltration (pesticides found in dry weather flows)	
		LW3-STW-CW20-OF22B	3-May-07	30.38	200%	9.4	38	100%	39%		

Table 5-15. Summary of Stormwater Statistics.

			Variable Name:	DRAINAGE	SURFACE	STORMCOND	RAINFALL	HYDROGRAPH	BASEFLOW		
Outfall(s)	**Facility or Location**	**Sample Event ID**	**Date Retrieved**	**Site Drainage Size (acres)**	**Impervious Surface Area %**	**Antecedant Storm Conditions (days without more than 0.1 inches of rain)**	**Rainfall Amount (100th of inch)**	**% of hydrograph measured**	**% baseflow versus stormwater runoff**	**Possible Non-Stormwater Discharges**	**"Other" events**
OF-M1	City - Mocks Bottom	LW3-STW-CW10-OFM1	26-Mar-07	71.1	79%	3.5	124	96%	0%	Frieghtliner Truck (100J)	
		LW3-STW-CW20-OFM1	9-Apr-07	71.1	79%	6.5	58	98%	0%		
		LW3-STW-CW30-OFM1	18-Apr-07	71.1	79%	2	49	85%	0%		
		LW3-STW-CW40-OFM1	10-Jun-07	71.1	79%	2	31	100%	0%		
OF-M2	City - Mocks Bottom	LW3-STW-CW10-OFM2	9-Apr-07	91.3	100%	6.5	58	97%	0%	Frieghtliner Truck (100J)	
		LW3-STW-CW20-OFM2	9-Apr-07	91.3	200%	1	31	100%	0%		
		LW3-STW-CW30-OFM2	23-Apr-07	91.3	300%	2.7	29	100%	0%		
		LW3-STW-CW40-OFM2	3-May-07	91.3	400%	9.3	61	88%	0%		
OF-22	City - Willbridge Industrial Area	LW3-STW-CW10-OF22	9-Apr-07	90.06	70%	5.6	52	81%	8%	Forest Park Streams and oil seepage into onside pipes and city conveyance system	
		LW3-STW-CW20-OF22	3-May-07	90.06	70%	9.7	56	75%	0%		Possible contamination by mineral oil spill
		LW3-STW-CW30-OF22	9-Jun-07	90.06	70%	2.2	30	100%	0%		
OF-16	City - Heavy Industrial	LW3-STW-CW10-OF16	9-Apr-07	41.81	100%	5.6	52	98%	0%		
		LW3-STW-CW20-OF16	18-Apr-07	41.81	100%	1.8	33	58%	0%		
		LW3-STW-CW30-OF16	23-Apr-07	41.81	100%	1.9	27	95%	0%		
		LW3-STW-CW40-OF16	3-May-07	41.81	100%	9.7	56	76%	0%		
		LW3-STW-CW50-OF16	10-Jun-07	41.81	100%	2.2	30	100%	0%		
WR-218	Albina - UPRR	LW3-STW-CW10-WR218	3-May-07	75.9	100%	10	42	100%	0%		
		LW3-STW-CW20-WR218	10-Jun-07	75.9	100%	2	28	100%	0%		
OF-52C[T4]	T4		24-Mar-07	21.51	88%	3.0	29	47%			
			7-Apr-07	21.51	88%	12.7	48	26%			
			1-May-07	21.51	88%	10.2	44	47%			
			20-May-07	21.51	88%	15.6	23	86%			
			16-Nov-07	21.51	88%	2.8	77	89%			
OF-53[T4]	T4		24-Mar-07	21.31	88%	3.0	29	86%			
			7-Apr-07	21.31	88%	12.7	48	82%			
			1-May-07	21.31	88%	10.2	44	72%			

Table 5-15. Summary of Stormwater Statistics.

			Variable Name:	DRAINAGE	SURFACE	STORMCOND	RAINFALL	HYDROGRAPH	BASEFLOW		
Outfall(s)	**Facility or Location**	**Sample Event ID**	**Date Retrieved**	**Site Drainage Size (acres)**	**Impervious Surface Area %**	**Antecedant Storm Conditions (days without more than 0.1 inches of rain)**	**Rainfall Amount (100th of inch)**	**% of hydrograph measured**	**% baseflow versus stormwater runoff**	**Possible Non-Stormwater Discharges**	**"Other" events**
WR-169[T4]	T4		24-Mar-07	17	95%	3.0	29	48%			
			7-Apr-07	17	95%	12.7	48	38%			
			1-May-07	17	95%	10.2	44	71%			
			20-May-07	17	95%	15.6	23	95%			
			16-Nov-07	17	95%	2.8	77	53%			
			15-Jan-08	17	95%	1.8	32	98%			
			26-Jan-08	17	95%	11.4	61	89%			
OF-18	City - Multiple Land Uses	LW3-STW-CW10-OF18	26-Mar-07	300	58%	3.6	118	100%	51%	Univar permitted Groundwater Cleanup (IND), Equilon groundwater cleanup (1500A), Owens-Corning non-contact cooling water (100J) and boiler blowdown (500J), and forest Park Streams	
		LW3-STW-CW20-OF18	9-Apr-07	300	58%	5.6	52	100%	13%		
		LW3-STW-CW30-OF18	18-Apr-07	300	58%	1.8	33	100%	27%[1]		
		LW3-STW-CW40-OF18	3-May-07	300	58%	9.7	56	100%	19%[1]		
OF-19	City - Multiple Land Uses	LW3-STW-CW10-OF19	26-Mar-07	491	39%	3.6	118	100%	11%	Forest Park Streams	
		LW3-STW-CW20-OF19	9-Apr-07	492	39%	5.36	52	100%	18%		
		LW3-STW-CW30-OF19	18-Apr-07	493	39%	1.8	33	100%	52%		
		LW3-STW-CW40-OF19	23-Apr-07	494	39%	1.9	27	100%	22%		
		LW3-STW-CW50-OF19	3-May-07	495	39%	9.7	56	62%	26%		

Notes
1 - % Baseflow is estimated because flow data is negative in some periods.
T4 - Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-16. Summary of Classification Tree Analysis.

Land Use	Location Type	Classification[a]	ChemID	N	Distribution	Number of Outliers	Classification Tree Proportional Reduction in Error (PRE)	Predictive Ability	Predictive Variables**	Number of Records Missing Variable Data***
Heavy Industrial	Representative	Original	As_D	23	Lognormal	5	0.432	MODERATE	STORMCOND, SURFACE	0
Heavy Industrial	Representative	Original	As_T	27	Lognormal	12	0.195	LOW	NC	0
Heavy Industrial	Representative	Original	BAP_T	25	None	8	0.599	MODERATE	SURFACE	0
Heavy Industrial	Representative	Original	Pb_D	23	Lognormal	6	0.312	LOW	NC	0
Heavy Industrial	Representative	Original	Pb_T	27	Lognormal	5	0.411	MODERATE	DRAINAGE, STORMCOND	0
Heavy Industrial	Representative	Original	PCB153_T	26	Lognormal	5	0.217	LOW	NC	0
Heavy Industrial	Unique	Original	As_T	36	None	9	0.5	MODERATE	SURFACE	0
Heavy Industrial	Unique	Original	BAP_T	25	None	7	0.597	MODERATE	DRAINAGE	7
Heavy Industrial	Unique	Original	Pb_D	23	None	9	0.635	MODERATE	SURFACE, DRAINAGE, STORMCOND	0
Heavy Industrial	Unique	Original	Pb_T	36	Lognormal	13	0.396	LOW	NC	0
Heavy Industrial	Unique	Original	PCB153_T	25	None	5	0.357	LOW	NC	7
Heavy Industrial	Unique	Original	TOC	38	Lognormal	10	0.46	MODERATE	HYDROGRPAH, SURFACE, DRAINAGE	7
Heavy Industrial	Unique	Original	TSS	38	Lognormal	6	0.265	LOW	NC	7
Light Industrial	Representative	Original	Pb_T	14	Lognormal	8	0.741	HIGH	HYDROGRAPH	0
Heavy Industrial	Unique	Reclassified	As_T	44	Lognormal	11	0.57	MODERATE	SURFACE	0
Heavy Industrial	Representative	Reclassified	BAP_T	44	Lognormal	9	0.319	LOW	NC	9
Heavy Industrial	Representative	Reclassified	PCB106_T	48	Lognormal	5	0.409	MODERATE	DRAINAGE, SURFACE	9
Heavy Industrial	Representative	Reclassified	PCB153_T	48	Lognormal	6	0.33	LOW	NC	9
Heavy Industrial	Representative	Reclassified	TOC	63	Lognormal	11	0.262	LOW	NC	9
Heavy/Light Industrial	Representative	Reclassified	Pb_D	26	Lognormal	6	0.48	MODERATE	STORMCOND	0
Heavy/Light Industrial	Representative	Reclassified	Pb_T	68	Lognormal	5	NA	NA	NA	NA

Note:
* Only data sets with >=4 outliers included
** Baseflow variable not included due to lack of data
*** Does not include Baseflow variable
Low > 0.400
Moderate = 0.4 to 0.7
High > 0.7
NC - Not calculated; predictive ability too low for meaningful analysis

Definition of Predictive Variables (See Table 5-15):

STORMCOND	Antecedant Storm Conditions (days without more than 0.1inches of rain)
SURFACE	Impervious Surface Area %
DRAINAGE	Site Drainage Size (acres)
HYDROGRAPH	% of hydrograph measured
RAINFALL	Rainfall Amount
BASEFLOW	% baseflow versus stormwater runoff

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			LocationName Basin D	Scenario				
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Heavy / Light Industrial	Representative	As_T				3	3	
		Pb_D				3	1	
		Pb_T				3	3	
		PCB018_T						
		PCB066_T						
		PCB194_T						
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			LocationName Scenario Basin D					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Light Industrial	Representative	ACE_T	3	2	3	3	3	3
		As_D	3	3	3	3	3	3
		As_T	3	3	3			3
		BAP_T	3	3	3	3	3	3
		Pb_D	3	2	3			3
		Pb_T	3		3			3
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC	3	3	3	3	3	3
		TSS	3	3	3	3	3	3
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**LocationName**	**Scenario**				
			Basin D					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			Basin L					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				3	3	
		Pb_D				3	3	
		Pb_T				3	3	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T				3	3	
Heavy Industrial	Representative	ACE_T	3	3	3	3	3	3
		As_D	3	2	3			3
		As_T	3	2	3			3
		BAP_T	3		3			3
		Pb_D	3	3	3			3
		Pb_T	3	3	3			3
		PCB018_T	3	2	3			3
		PCB066_T	3	2	3			3
		PCB106_T	3	3	3	3	3	3
		PCB153_T	3	3	3	3	3	3
		PCB194_T	3	3	3			3
		TOC	3	3	3	3	2	3
		TSS	3	3	3	3	3	3
	Unique	ACE_T						
		As_D				3	3	
		As_T						
		BAP_T				3	3	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin L**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			Basin L					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			Basin M					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D				3	1	
		Pb_T				3	2	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T				3	3	
Heavy Industrial	Representative	ACE_T	3	2	3	3	2	3
		As_D	3		3			3
		As_T	3		3			3
		BAP_T	3		3			3
		Pb_D	3	3	3			3
		Pb_T	3	2	3			3
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	1	3			3
		PCB153_T	3	1	3			3
		PCB194_T	3	3	3			3
		TOC	3	3	3	3	3	3
		TSS	3	3	3	3	3	3
	Unique	ACE_T						
		As_D				3	3	
		As_T				3	3	
		BAP_T				3	3	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				3	3	
		PCB153_T				3	3	
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin M**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin M**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin Q**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				1	1	
		Pb_D				1	1	
		Pb_T				1	1	
		PCB018_T				2	2	
		PCB066_T				2	2	
		PCB194_T				2	2	
Heavy Industrial	Representative	ACE_T	2	2	2	2	2	2
		As_D	1	1	1	1	1	1
		As_T	1	1	1			1
		BAP_T	2	1	2	2	1	2
		Pb_D	1	1	1			1
		Pb_T	1	1	1			1
		PCB018_T	2	2	2			2
		PCB066_T	2	2	2			2
		PCB106_T	2	2	2	2	2	2
		PCB153_T	2	2	2	2	2	2
		PCB194_T	2	2	2			2
		TOC	2	2	2	2	2	2
		TSS	2	2	2	2	2	2
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin Q**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin Q**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin R**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				3	1	
		Pb_D						
		Pb_T						
		PCB018_T				3	3	
		PCB066_T				3	2	
		PCB194_T				3	2	
Heavy Industrial	Representative	ACE_T	3	3	3	3	3	3
		As_D	3	3	3	3	2	3
		As_T	3	1	3			3
		BAP_T	3	2	3	3	2	3
		Pb_D	3	1	3			3
		Pb_T	3	1	3			3
		PCB018_T	3	2	3			3
		PCB066_T	3	2	3			3
		PCB106_T	3	2	3	3	2	3
		PCB153_T	3	2	3	3	2	3
		PCB194_T	3	2	3			3
		TOC	3		3			3
		TSS	3	2	3	3	2	3
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D				3	3	
		Pb_T				3	3	
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC				3	3	
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			Basin R					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin R**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin T**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				3	3	
		Pb_D				3	3	
		Pb_T				3	3	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T				3	3	
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin T**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T	3	2	3	3	3	3
		As_D	3	3	3	3	3	3
		As_T	3	3	3			3
		BAP_T	3	2	3	3	3	3
		Pb_D	3	3	3			3
		Pb_T	3	1	3			3
		PCB018_T	3	3	3			3
		PCB066_T	3		3			3
		PCB106_T	3		3	3	3	3
		PCB153_T	3		3	3	3	3
		PCB194_T	3	2	3			3
		TOC	3	3	3	3	3	3
		TSS	3	3	3	3	3	3
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Basin T**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF16**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				5	5	
		Pb_D						
		Pb_T				5	5	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T				3	3	
Heavy Industrial	Representative	ACE_T	3	3	3	3	3	3
		As_D	3	3	3	3	3	3
		As_T	5	5	5			5
		BAP_T	3	3	3	3	3	3
		Pb_D	3	1	3			3
		Pb_T	5	5	5			5
		PCB018_T	3	2	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3	3	3	3
		PCB153_T	3	2	3	3	3	3
		PCB194_T	3	3	3			3
		TOC	4	4	4	4	4	4
		TSS	5	5	5	5	5	5
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D				3	3	
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF16**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF16**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF18**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB194_T						
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF18**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T	3	3	3	3	3	3
		As_D	3	3	3	3	3	3
		As_T	4	4	4	4	4	4
		BAP_T	3	3	3	3	3	3
		Pb_D	3	3	3	3	3	3
		Pb_T	4	4	4	4	4	4
		PCB018_T	3	3	3	3	3	3
		PCB066_T	3	2	3	3	3	3
		PCB106_T	3	2	3	3	3	3
		PCB153_T	2	2	3	2	2	3
		PCB194_T	2	2	3	2	2	3
		TOC	4	4	4	4	4	4
		TSS	4	4	4	4	4	4

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF18**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			OF19					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB194_T						
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF19**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T	3	3	3	3	3	3
		As_D	3	3	3	3	3	3
		As_T	4	4	4	4	4	4
		BAP_T	3	3	3	3	3	3
		Pb_D	3	3	3	3	3	3
		Pb_T	4	4	4	4	4	4
		PCB018_T	3	3	3	3	3	3
		PCB066_T	3	3	3	3	3	3
		PCB106_T	3	3	3	3	3	3
		PCB153_T	3	3	3	3	3	3
		PCB194_T	3	3	3	3	3	3
		TOC	5	5	5	5	5	5
		TSS	5	5	5	5	5	5

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF19**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			OF22					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Heavy / Light Industrial	Representative	As_T						
		Pb_D				2	1	
		Pb_T				3	3	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T				3	3	
Heavy Industrial	Representative	ACE_T	3	3	3	3	3	3
		As_D	2	2	2			2
		As_T	3		3			3
		BAP_T	3	3	3	3	3	3
		Pb_D	2	2	2			2
		Pb_T	3	3	3			3
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3	3	3	3
		PCB153_T	3	3	3	3	3	3
		PCB194_T	3	3	3			3
		TOC	3	3	3	3	3	3
		TSS	3	3	3	3	3	3
	Unique	ACE_T						
		As_D				2	2	
		As_T				3	3	
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			OF22					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF22**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF22B**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T						
		PCB018_T				2	2	
		PCB066_T				2	2	
		PCB194_T						
Heavy Industrial	Representative	ACE_T	2	2	2	2	2	2
		As_D	2	1	2			2
		As_T	2		2			2
		BAP_T	2	2	2	2	2	2
		Pb_D	2		2			2
		Pb_T	2		2			2
		PCB018_T	2	1	2			2
		PCB066_T	2	1	2			2
		PCB106_T	2	2	2	2	2	2
		PCB153_T	2	1	2	2	2	2
		PCB194_T	2	2	2			2
		TOC	2	1	2	2	1	2
		TSS	2	2	2	2	2	2
	Unique	ACE_T						
		As_D				2	2	
		As_T				2	1	
		BAP_T						
		Pb_D				2	2	
		Pb_T				2	2	
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T				2	2	
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF22B**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF22B**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF22C**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB194_T						
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF22C**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T	2	2	2	2	2	2
		As_D	1	1	1	1	1	1
		As_T	2	2	2	2	2	2
		BAP_T	1	1	1	1	1	1
		Pb_D	1	1	1	1	1	1
		Pb_T	2	2	2	2	2	2
		PCB018_T	2	2	2	2	2	2
		PCB066_T	2	2	2	2	2	2
		PCB106_T	2	2	2	2	2	2
		PCB153_T	2	2	2	2	2	2
		PCB194_T	2	2	2	2	2	2
		TOC	2	2	2	2	2	2
		TSS	2	2	2	2	2	2
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF22C**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OF49**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB194_T						
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			OF49					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			OF49					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T	3	3	3	3	3	3
		As_D	1	1	1	1	1	1
		As_T	3	3	3	3	3	3
		BAP_T	3	3	3	3	3	3
		Pb_D	1	1	1	1	1	1
		Pb_T	3	3	3	3	3	3
		PCB018_T	2	2	2	2	2	2
		PCB066_T	2	2	2	2	2	2
		PCB106_T	2	2	2	2	2	2
		PCB153_T	2	2	2	2	2	2
		PCB194_T	2	2	2	2	2	2
		TOC	3	3	3	3	3	3
		TSS	3	3	3	3	3	3

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OFM1**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				4	4	
		Pb_D				3	3	
		Pb_T				4	4	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T				3	3	
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OFM1**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T	3	1	3	3	3	3
		As_D	3	3	3	3	3	3
		As_T	4	4	4			4
		BAP_T	3	3	3	3	3	3
		Pb_D	3	3	3			3
		Pb_T	4	2	4			4
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3	3	3	3
		PCB153_T	3	3	3	3	3	3
		PCB194_T	3	3	3			3
		TOC	4	4	4	4	4	4
		TSS	4	4	4	4	4	4
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OFM1**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OFM2**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				4	4	
		Pb_D				2	2	
		Pb_T				4	4	
		PCB018_T				4	4	
		PCB066_T				4	4	
		PCB194_T				4	4	
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**OFM2**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T	4	4	4	4	4	4
		As_D	2	2	2	2	2	2
		As_T	4	4	4			4
		BAP_T	4	4	4	4	4	4
		Pb_D	2	2	2			2
		Pb_T	4	3	4			4
		PCB018_T	4	4	4			4
		PCB066_T	4	4	4			4
		PCB106_T	4	4	4	4	4	4
		PCB153_T	4	4	4	4	4	4
		PCB194_T	4	4	4			4
		TOC	4	4	4	4	4	4
		TSS	4	4	4	4	4	4
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			OFM2					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			Outfall 53					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB194_T						
Heavy Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Outfall 53**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**Outfall 53**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T	3	3	3	3	3	3
		As_D	2	2	2	2	2	2
		As_T	2	1	2	2	2	2
		BAP_T	3	2	3	3	3	3
		Pb_D	2	2	2	2	2	2
		Pb_T	2		2	2	2	2
		PCB018_T	3	3	3	3	3	3
		PCB066_T	3	3	3	3	3	3
		PCB106_T	3	3	3	3	3	3
		PCB153_T	3	3	3	3	3	3
		PCB194_T	3	3	3	3	3	3
		TOC	3	3	3	3	3	3
		TSS	3	3	3	3	3	3

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR107					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				4	4	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				3	3	
		As_D						
		As_T						
		BAP_T				3		
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				3	3	
		PCB153_T				3	3	
		PCB194_T						
		TOC				4	4	
		TSS				4	4	
	Unique	ACE_T	3	3	3			3
		As_D	3	3	3	3	3	3
		As_T	4	4	4	4	4	4
		BAP_T	3		3			3
		Pb_D	3	3	3	3	3	3
		Pb_T	4	4	4			4
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3			3
		PCB153_T	3	3	3			3
		PCB194_T	3	3	3	3	3	3
		TOC	4	4	4			4
		TSS	4	4	4			4

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR107					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR107**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR123**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				4	3	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				3	3	
		As_D						
		As_T						
		BAP_T				3	3	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				3	3	
		PCB153_T				3	3	
		PCB194_T						
		TOC				5	4	
		TSS				5	5	
	Unique	ACE_T	3	3	3			3
		As_D	2	2	2	2	2	2
		As_T	4	2	4	4	1	4
		BAP_T	3	3	3			3
		Pb_D	2	2	2	2	2	2
		Pb_T	4	2	4			4
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3			3
		PCB153_T	3	3	3			3
		PCB194_T	3	3	3	3	3	3
		TOC	5	4	5			5
		TSS	5	3	5			5

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR123**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR123**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR14					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				5	5	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				3	3	
		As_D						
		As_T						
		BAP_T				3	1	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				3	3	
		PCB153_T				3	3	
		PCB194_T						
		TOC				5	4	
		TSS				5	5	
	Unique	ACE_T	3	3	3			3
		As_D	3	3	3	3	3	3
		As_T	5	5	5	5	5	5
		BAP_T	3	1	3			3
		Pb_D	3	2	3	3	3	3
		Pb_T	5	5	5			5
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3			3
		PCB153_T	3	3	3			3
		PCB194_T	3	3	3	3	3	3
		TOC	5	4	5			5
		TSS	5	5	5			5

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR14					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR14**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR142/145					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				2	2	
		PCB018_T				1	1	
		PCB066_T				1	1	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				2	2	
		As_D						
		As_T						
		BAP_T				2	2	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				1	1	
		PCB153_T				1	1	
		PCB194_T						
		TOC				2	1	
		TSS				2	2	
	Unique	ACE_T	2	2	2			2
		As_D	1	1	1	1	1	1
		As_T	2	2	2	2	2	2
		BAP_T	2	2	2			2
		Pb_D	1	1	1	1	1	1
		Pb_T	2	2	2			2
		PCB018_T	1	1	1			1
		PCB066_T	1	1	1			1
		PCB106_T	1	1	1			1
		PCB153_T	1	1	1			1
		PCB194_T	1	1	1	1	1	1
		TOC	2	1	2			2
		TSS	2	2	2			2

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR142/145					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR142/145**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR147					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				5	3	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				3	3	
		As_D						
		As_T						
		BAP_T				3	3	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				3	2	
		PCB153_T				3	2	
		PCB194_T						
		TOC				5	4	
		TSS				5	5	
	Unique	ACE_T	3	3	3			3
		As_D	3	3	3	3	3	3
		As_T	5	5	5	5	5	5
		BAP_T	3	3	3			3
		Pb_D	3		3	3	3	3
		Pb_T	5	2	5			5
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	2	3			3
		PCB153_T	3	2	3			3
		PCB194_T	3	2	3	3	3	3
		TOC	5	4	5			5
		TSS	5	5	5			5

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR147					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR147**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR161**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				4	3	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				3	3	
		As_D						
		As_T						
		BAP_T				3	3	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				3	3	
		PCB153_T				3	2	
		PCB194_T						
		TOC				4	4	
		TSS				4	4	
	Unique	ACE_T	3	3	3			3
		As_D	3	3	3	3	3	3
		As_T	4	4	4	4	4	4
		BAP_T	3	3	3			3
		Pb_D	3	3	3	3	3	3
		Pb_T	4	3	4			4
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3			3
		PCB153_T	3	2	3			3
		PCB194_T	3	3	3	3	3	3
		TOC	4	4	4			4
		TSS	4	3	4			4

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR161**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR161**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR218**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				2	2	
		Pb_D				2	1	
		Pb_T				2	2	
		PCB018_T				2	2	
		PCB066_T				2	2	
		PCB194_T				2	2	
Heavy Industrial	Representative	ACE_T	2	2	2	2	2	2
		As_D	2	2	2	2	2	2
		As_T	2	1	2			2
		BAP_T	2	2	2	2	2	2
		Pb_D	2	2	2			2
		Pb_T	2	2	2			2
		PCB018_T	2	2	2			2
		PCB066_T	2	2	2			2
		PCB106_T	2	2	2	2	2	2
		PCB153_T	2	2	2	2	2	2
		PCB194_T	2	2	2			2
		TOC	2	2	2	2	2	2
		TSS	2	2	2	2	2	2
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR218**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR218**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR22**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				4	4	
		PCB018_T				3	3	
		PCB066_T				3	3	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				3	2	
		As_D						
		As_T						
		BAP_T				3	3	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				3	3	
		PCB153_T				3	3	
		PCB194_T						
		TOC				4	4	
		TSS				4	4	
	Unique	ACE_T	3	2	3			3
		As_D	3	3	3	3	3	3
		As_T	4	1	4	4	1	4
		BAP_T	3	3	3			3
		Pb_D	3	3	3	3	3	3
		Pb_T	4		4			4
		PCB018_T	3	3	3			3
		PCB066_T	3	3	3			3
		PCB106_T	3	3	3			3
		PCB153_T	3	3	3			3
		PCB194_T	3	3	3	3	3	3
		TOC	4	4	4			4
		TSS	4	3	4			4

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR22					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR22**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR384						WR4
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**	**Raw Data**
Heavy / Light Industrial	Representative	As_T							
		Pb_D							
		Pb_T							
		PCB018_T				4	4		
		PCB066_T				4	1		
		PCB194_T							
Heavy Industrial	Representative	ACE_T				3	1		
		As_D							
		As_T							
		BAP_T				3	1		
		Pb_D							
		Pb_T							
		PCB018_T							
		PCB066_T							
		PCB106_T				4	1		
		PCB153_T				4	1		
		PCB194_T							
		TOC				5	1		
		TSS				5	4		
	Unique	ACE_T	3	1	3			3	3
		As_D	2	2	2	2	2	2	3
		As_T	4	4	4	4	4	4	4
		BAP_T	3	1	3			3	3
		Pb_D	2		2	2	2	2	3
		Pb_T	4	1	4	4	4	4	4
		PCB018_T	4	1	4			4	3
		PCB066_T	4	1	4			4	3
		PCB106_T	4	1	4			4	3
		PCB153_T	4	1	4			4	3
		PCB194_T	4	2	4	4	4	4	3
		TOC	5		5			5	4
		TSS	5	3	5			5	4

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR384						WR4
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**	**Raw Data**
Light Industrial	Representative	ACE_T							
		As_D							
		As_T							
		BAP_T							
		Pb_D							
		Pb_T							
		PCB018_T							
		PCB066_T							
		PCB106_T							
		PCB153_T							
		PCB194_T							
		TOC							
		TSS							
Open Space	Representative	ACE_T							
		As_D							
		As_T							
		BAP_T							
		Pb_D							
		Pb_T							
		PCB018_T							
		PCB066_T							
		PCB106_T							
		PCB153_T							
		PCB194_T							
		TOC							
		TSS							
Open Space / Heavy Industrial	Multiple	ACE_T							
		As_D							
		As_T							
		BAP_T							
		Pb_D							
		Pb_T							
		PCB018_T							
		PCB066_T							
		PCB106_T							
		PCB153_T							
		PCB194_T							
		TOC							
		TSS							

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR384**						**WR4**
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**	**Raw Data**
Residential	Representative	ACE_T							
		As_D							
		As_T							
		BAP_T							
		Pb_D							
		Pb_T							
		PCB018_T							
		PCB066_T							
		PCB106_T							
		PCB153_T							
		PCB194_T							
		TOC							
		TSS							

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR67**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T				5	5	
		Pb_D				4	4	
		Pb_T				5	5	
		PCB018_T				5	5	
		PCB066_T				5	5	
		PCB194_T				5	5	
Heavy Industrial	Representative	ACE_T	4	4	4	4	4	4
		As_D	4	4	4	4	4	4
		As_T	5	5	5			5
		BAP_T	4	4	4	4	4	4
		Pb_D	4	4	4			4
		Pb_T	5	5	5			5
		PCB018_T	5	5	5			5
		PCB066_T	5	5	5			5
		PCB106_T	5	5	5	5	5	5
		PCB153_T	5	5	5	5	5	5
		PCB194_T	5	5	5			5
		TOC	6	6	6	6	6	6
		TSS	6	6	6	6	6	6
	Unique	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			WR67					
Land Use	Location Type	ChemID	Duplicate Outliers Removed	Original Data / Outliers Removed	Raw Data	Reclassified Data	Reclassified Data / Outliers Removed	Unaltered Data
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR67**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR96**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Heavy / Light Industrial	Representative	As_T						
		Pb_D						
		Pb_T				4	4	
		PCB018_T				2	2	
		PCB066_T				2	2	
		PCB194_T						
Heavy Industrial	Representative	ACE_T				3	3	
		As_D						
		As_T						
		BAP_T				2	2	
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T				2	2	
		PCB153_T				2	2	
		PCB194_T						
		TOC				4	3	
		TSS				4	4	
	Unique	ACE_T	3	3	3			3
		As_D	3		3	3		3
		As_T	4		4	4		4
		BAP_T	2	2	2			2
		Pb_D	3		3	3	3	3
		Pb_T	4	4	4			4
		PCB018_T	2	2	2			2
		PCB066_T	2	2	2			2
		PCB106_T	2	2	2			2
		PCB153_T	2	2	2			2
		PCB194_T	2	2	2	2	2	2
		TOC	4	3	4			4
		TSS	4	4	4			4

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR96**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Light Industrial	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						
Open Space / Heavy Industrial	Multiple	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-17. Summary of Preliminary Data Analysis.

Count of Result			**WR96**					
Land Use	**Location Type**	**ChemID**	**Duplicate Outliers Removed**	**Original Data / Outliers Removed**	**Raw Data**	**Reclassified Data**	**Reclassified Data / Outliers Removed**	**Unaltered Data**
Residential	Representative	ACE_T						
		As_D						
		As_T						
		BAP_T						
		Pb_D						
		Pb_T						
		PCB018_T						
		PCB066_T						
		PCB106_T						
		PCB153_T						
		PCB194_T						
		TOC						
		TSS						

Table 5-18. Percentage of Non-Detects by Chemical and Land Use Type.

ChemID	Chemical Name	Fraction	Units	Heavy Industrial (unique)			Heavy Industrial (representative)			Heavy Industrial + Light Industrial (representative)			Light Industrial (representative)			Open Space (representative)		
				Total n	n_{det}	f_{nd}	Total n	n_{det}	f_{nd}	Total n	n_{det}	f_{nd}	Total n	n_{det}	f_{nd}	Total n	n_{det}	f_{nd}
ACE_T	Acenaphthene	total	µg/L				47	41	**13%**				13	11	**15%**	2	0	**100%**
As_D	Arsenic	dissolved	µg/L	30	30	0%	12	12	0%				11	11	0%	1	1	0%
As_T	Arsenic	total	µg/L	33	32	**3%**				31	30	**3%**				2	2	0%
BAP_T	Benzo(a)pyrene	total	µg/L	6	6	0%	35	32	**9%**				13	13	0%	1	0	**100%**
Pb_D	Lead	dissolved	µg/L	31	30	**3%**				20	19	**5%**				1	1	0%
Pb_T	Lead	total	µg/L	9	9	0%				63	63	0%				2	2	0%
PCB018_T	PCB018	total	pg/L							61	52	**15%**				2	0	**100%**
PCB066_T	PCB066 & 076	total	pg/L							57	53	**7%**				2	0	**100%**
PCB106_T	PCB106 & 118	total	pg/L	3	3	0%	43	40	**7%**				10	10	0%	2	0	**100%**
PCB153_T	PCB153	total	pg/L	3	3	0%	42	42	0%				10	10	0%	2	1	**50%**
PCB194_T	PCB194	total	pg/L	27	24	**11%**				33	28	**15%**				2	0	**100%**
TOC	Total organic carbon	NA	mg/L	3	3	0%	52	52	0%				14	14	0%	2	2	0%
TSS	Total suspended solids	NA	mg/L				65	65	0%				14	14	0%	2	2	0%

Notes:

Total n Total number of samples.
n_{det} Number of detected values.
f_{nd} Frequency of nondetect values.

Table 5-18. Percentage of Non-Detects by Chemical and Land Use Type.

ChemID	Chemical Name	Fraction	Units	Open Space / Heavy Industrial (multiple)			Residential (representative)			Grand Total (all samples)		
				Total n	**n_{det}**	**f_{nd}**	**Total n**	**n_{det}**	**f_{nd}**	**Total n**	**n_{det}**	**f_{nd}**
ACE_T	Acenaphthene	total	µg/L	6	6	0%	6	3	**50%**	74	61	**18%**
As_D	Arsenic	dissolved	µg/L	6	6	0%	3	3	0%	63	63	0%
As_T	Arsenic	total	µg/L	8	8	0%	5	5	0%	79	77	**3%**
BAP_T	Benzo(a)pyrene	total	µg/L	6	6	0%	6	4	**33%**	67	61	**9%**
Pb_D	Lead	dissolved	µg/L	6	6	0%	3	3	0%	61	59	**3%**
Pb_T	Lead	total	µg/L	8	8	0%	5	5	0%	87	87	0%
PCB018_T	PCB018	total	pg/L	6	6	0%	5	3	**40%**	74	61	**18%**
PCB066_T	PCB066 & 076	total	pg/L	6	6	0%	5	4	**20%**	70	63	**10%**
PCB106_T	PCB106 & 118	total	pg/L	6	6	0%	5	4	**20%**	69	63	**9%**
PCB153_T	PCB153	total	pg/L	5	5	0%	5	5	0%	67	66	**1%**
PCB194_T	PCB194	total	pg/L	5	5	0%	5	4	**20%**	72	61	**15%**
TOC	Total organic carbon	NA	mg/L	9	9	0%	6	6	0%	86	86	0%
TSS	Total suspended solids	NA	mg/L	9	9	0%	6	6	0%	96	96	0%

Notes:

Total n Total number of samples.
n_{det} Number of detected values.
f_{nd} Frequency of nondetect values.

Table 5-19. Target Detection Limits.
(from Round 3A Stormwater FSP, Table 2-6b)

ChemID	Chemical Name	Fraction	Unit	Laboratory MDL	Laboratory MRL
As_D	Arsenic	dissolved	ppb	0.00005[a]	0.00005
As_T	Arsenic	total	ppb	0.00005[a]	0.00005
Pb_D	Lead	dissolved	ppb	0.00001	0.00002
Pb_T	Lead	total	ppb	0.00001	0.00002
ACE_T	Acenaphthene	total	ppb	0.0097	0.02
BAP_T	Benzo(a)pyrene	total	ppb	0.0087	0.02
PCB018_T	PCB018	total	ppt	3.4	5.0 - 10
PCB066_T	PCB066 & 076	total	ppt	6.5	5.0 - 10
PCB106_T	PCB106 & 118	total	ppt	1.9	5.0 - 10
PCB153_T	PCB153	total	ppt	3.8	5.0 - 10
PCB194_T	PCB194	total	ppt	0.8	5.0 - 10
TOC	Total organic carbon	NA	ppm	0.07	0.5
TSS	Total suspended solids	NA	ppm	1	1

Note
a - In FSP table, MDL = "TBD." Used MRL for ND screening.

Table 5-20. Removed Non-Detect Values.

Location Name	parent_sample_code	Sample Date	RevLUC	RevLocTypeCode	ACE_T Acenaphthene total ppb Result	As_T Arsenic total ppb Result	Pb_D Lead dissolved ppb Result	PCB018_T PCB018 total ppt Result	PCB066_T PCB066 & 076 total ppt Result	PCB106_T PCB106 & 118 total ppt Result	PCB153_T PCB153 total ppt Result	PCB194_T PCB194 total ppt Result
		Total number of ND values to be excluded			**4**	**2**	**2**	**13**	**7**	**6**	**1**	**11**
WR169[T4]	WLCT4C07BsnD070324	3/24/2007	2	2								
WR169[T4]	WLCT4C07BsnD070503	5/3/2007	2	2	0.02							
WR20[T4]	WLCT4C07BsnL070503	5/3/2007	1.5	2		0.5						
WR183[T4]	WLCT4C07BsnR070324	3/24/2007	1	2	0.027							
WR183[T4]	WLCT4C07BsnR070407	4/7/2007	1	2	0.02							
OF52C[T4]	WLCT4C07BsnT070324	3/24/2007	2	2								
OF52C[T4]	WLCT4C07BsnT070503	5/3/2007	2	2	0.021							
OF22C	LW3-STW-CW10-OF22C	4/18/2007	3	2				26.15	26.15	39.05		26.15
OF22C	LW3-STW-CW20-OF22C	4/23/2007	3	2				26.65	26.65	13.8	26.65	26.65
OF49	LW3-STW-CW10-OF49	4/9/2007	5	2				35.5	28			28
OF49	LW3-STW-CW20-OF49	4/23/2007	5	2				37.9		95.5		
OFM1	LW3-STW-CW30-OFM1	4/18/2007	1.5	2				106				
OFM2	LW3-STW-CW10-OFM2	4/9/2007	1.5	2				101				
OFM2	LW3-STW-CW20-OFM2	4/9/2007	1.5	2				48.3				26.9
OF53[T4]	WLCT4C07OF53070324	3/24/2007	5	2								
OF53[T4]	WLCT4C07OF53070503	5/3/2007	5	2								
WR107	LW3-STW-CW20-WR107	4/9/2007	1	1								27.1
WR107	LW3-STW-CW20-WR107	4/9/2007	1.5	2				27.1	27.1			
WR107	LW3-STW-CW30-WR107	4/18/2007	1	2						119		
WR107	LW3-STW-CW30-WR107	4/18/2007	1.5	2				51				
WR14	LW3-STW-CW30-WR14	4/23/2007	1	1								26.4
WR14	LW3-STW-CW30-WR14	4/23/2007	1	2						106		
WR14	LW3-STW-CW30-WR14	4/23/2007	1.5	2				26.4				
WR142/145	LW3-STW-CW10-WR142	6/10/2007	1	1			0.098					26.5
WR142/145	LW3-STW-CW10-WR142	6/10/2007	1.5	2				26.5				
WR142/145	LW3-STW-CW10-WR145	4/9/2007	1	1		0.007						
WR67	LW3-STW-CW10-WR67	4/9/2007	1.5	2								26.6
WR67	LW3-STW-CW20-WR67	4/9/2007	1.5	2					29.9			29.9
WR67	LW3-STW-CW30-WR67	4/18/2007	1.5	2				99.4				
WR67	LW3-STW-CW40-WR67	4/23/2007	1	2						37.5		
WR67	LW3-STW-CW40-WR67	4/23/2007	1.5	2				27.5	27.2			29.1
WR67	LW3-STW-CW60-WR67	6/10/2007	1.5	2			0.128		24.6			24.6

Note:
T4- Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-21. Percentage of Non-Detects by Chemical and Land Use Type.
(Revised Outliers Excluded; High ND Excluded)

				Heavy Industrial (unique)				**Heavy Industrial (representative)**				**Heavy Industrial + Light (representative)**				**Light Industrial (representative)**				**Open Space (representative)**			
ChemID	**Chemical Name**	**Fraction**	**Units**	**Total n**	**n_{det}**	**f_{nd}**	**Treatment of ND values[a]**	**Total n**	**n_{det}**	**f_{nd}**	**Treatment of ND values[a]**	**Total n**	**n_{det}**	**f_{nd}**	**Treatment of ND values[a]**	**Total n**	**n_{det}**	**f_{nd}**	**Treatment of ND values[a]**	**Total n**	**n_{det}**	**f_{nd}**	**Treatment of ND values[a]**
ACE_T	Acenaphthene	total	µg/L					45	41	**9%**	**ND = sub**					11	11	0%	all det	2	0	**100%**	**ND = 1/2 DL**
As_D	Arsenic	dissolved	µg/L	30	30	0%	all det	12	12	0%	all det					11	11	0%	all det	1	1	0%	all det
As_T	Arsenic	total	µg/L	32	32	0%	all det					30	30	0%	all det					2	2	0%	all det
BAP_T	Benzo(a)pyrene	total	µg/L	6	6	0%	all det	35	32	**9%**	**ND = sub**					13	13	0%	all det	1	0	**100%**	**ND = 1/2 DL**
Pb_D	Lead	dissolved	µg/L	30	30	0%	all det					19	19	0%	all det					1	1	0%	all det
Pb_T	Lead	total	µg/L	9	9	0%	all det					63	63	0%	all det					2	2	0%	all det
PCB018_T	PCB018	total	pg/L									52	52	0%	all det								
PCB066_T	PCB066 & 076	total	pg/L									53	53	0%	all det								
PCB106_T	PCB106 & 118	total	pg/L	3	3	0%	all det	40	40	0%	all det					10	10	0%	all det				
PCB153_T	PCB153	total	pg/L	3	3	0%	all det	42	42	0%	all det					10	10	0%	all det	1	1	0%	all det
PCB194_T	PCB194	total	pg/L	24	24	0%	all det				all det	28	28	0%	all det								
TOC	Total organic carbon	NA	mg/L	3	3	0%	all det	52	52	0%	all det					14	14	0%	all det	2	2	0%	all det
TSS	Total suspended solids	NA	mg/L					65	65	0%	all det					14	14	0%	all det	2	2	0%	all det

Notes:

High ND Any nondetect value > the target detection limit
Total n Total number of samples.
n_{det} Number of detected values.
f_{nd} Frequency of nondetect values.

a -Substitution was applied to nondetect values according to the following rules:

n >/= 8 : Create extrapolated non-detect values using ProUCL.
n < 8 : Use ½ DL

Table 5-21. Percentage of Non-Detects by Chemical and Land Use Type.
(Revised Outliers Excluded; High ND Excluded)

ChemID	Chemical Name	Fraction	Units	Open Space / Heavy (multiple) Total n	n_{det}	f_{nd}	Treatment of ND values[a]	Residential (representative) Total n	n_{det}	f_{nd}	Treatment of ND values[a]	Grand Total (all samples) Total n	n_{det}	f_{nd}
ACE_T	Acenaphthene	total	µg/L	6	6	0%	all det	6	3	**50%**	**ND = 1/2 DL**	70	61	**13%**
As_D	Arsenic	dissolved	µg/L	6	6	0%	all det	3	3	0%	all det	63	63	0%
As_T	Arsenic	total	µg/L	8	8	0%	all det	5	5	0%	all det	77	77	0%
BAP_T	Benzo(a)pyrene	total	µg/L	6	6	0%	all det	6	4	**33%**	**ND = 1/2 DL**	67	61	**9%**
Pb_D	Lead	dissolved	µg/L	6	6	0%	all det	3	3	0%	all det	59	59	0%
Pb_T	Lead	total	µg/L	8	8	0%	all det	5	5	0%	all det	87	87	0%
PCB018_T	PCB018	total	pg/L	6	6	0%	all det	3	3	0%	all det	61	61	0%
PCB066_T	PCB066 & 076	total	pg/L	6	6	0%	all det	4	4	0%	all det	63	63	0%
PCB106_T	PCB106 & 118	total	pg/L	6	6	0%	all det	4	4	0%	all det	63	63	0%
PCB153_T	PCB153	total	pg/L	5	5	0%	all det	5	5	0%	all det	66	66	0%
PCB194_T	PCB194	total	pg/L	5	5	0%	all det	4	4	0%	all det	61	61	0%
TOC	Total organic carbon	NA	mg/L	9	9	0%	all det	6	6	0%	all det	86	86	0%
TSS	Total suspended solids	NA	mg/L	9	9	0%	all det	6	6	0%	all det	96	96	0%

Notes:
High ND Any nondetect value > the target detection limit
Total n Total number of samples.
n_{det} Number of detected values.
f_{nd} Frequency of nondetect values.
a -Substitution was applied to nondetect values according to the following rules:
n >/= 8 : Create extrapolated non-detect values using ProUCL.
n < 8 : Use ½ DL

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW50-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW50-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	LW3-STW-CW40-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	6/10/2007	Comp	LW3-STW-CW50-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW50-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW20-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW50-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF16
Upper Study Area 1	OF16	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OF16
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW40-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF18
Upper ISA	OF18	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF18
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW50-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW50-OF19

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW50-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW50-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/23/2007	Comp	LW3-STW-CW40-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/23/2007	Comp	LW3-STW-CW40-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/23/2007	Comp	LW3-STW-CW40-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/23/2007	Comp	LW3-STW-CW40-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/23/2007	Comp	LW3-STW-CW40-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW50-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/23/2007	Comp	LW3-STW-CW40-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	5/3/2007	Comp	LW3-STW-CW50-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/18/2007	Comp	LW3-STW-CW30-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	3/26/2007	Comp	LW3-STW-CW10-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/9/2007	Comp	LW3-STW-CW20-OF19
Upper ISA	OF19	Open Space / Heavy Industrial	4	Open Space / Heavy Industrial	4	Multiple	4	Multiple	4	TRUE	4/23/2007	Comp	LW3-STW-CW40-OF19
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22
Upper ISA	OF22	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF22
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW20-OF22B
Upper ISA	OF22B	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/27/2007	Comp	LW3-STW-CW10-OF22B
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW10-OF22C
Middle ISA	OF22C	Open Space	3	Open Space	3	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF22C
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW30-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW20-OF49
Middle ISA	OF49	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OF49
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnT070520
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnT070520
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnT070520
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnT070520

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnT070324
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnT070503
Lower ISA	OF52C[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnT070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07OF53070503
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07OF53070324
Lower ISA	OF53[T4]	Residential	5	Residential	5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07OF53070407
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW40-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW40-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW40-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW40-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW40-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW40-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/26/2007	Comp	LW3-STW-CW10-OFM1
Upper ISA	OFM1	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM1
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW40-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW30-OFM2
Upper ISA	OFM2	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-OFM2
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR107

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR107
Middle ISA	WR107	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR107
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/23/2007	Comp	LW3-STW-CW30-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR123

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/11/2007	Comp	LW3-STW-CW50-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/11/2007	Comp	LW3-STW-CW50-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/11/2007	Comp	LW3-STW-CW50-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/11/2007	Comp	LW3-STW-CW50-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/11/2007	Comp	LW3-STW-CW50-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/11/2007	Comp	LW3-STW-CW50-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR123
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR123

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR123	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/11/2007	Comp	LW3-STW-CW50-WR123
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW50-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW50-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW50-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW50-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR14

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW50-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW50-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR14
Upper Study Area 2	WR14	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR14
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR145
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR145
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR145
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR145
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR145
Upper ISA	WR142/145	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW10-WR142
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW50-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW50-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW50-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW50-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW50-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR147
Upper ISA	WR147	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW50-WR147
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR161
Upper ISA	WR161	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR161
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnD070407
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnD070520
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnD070503
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnD070520
Lower ISA	WR169[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnD070503

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR169[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnD070407
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnD070503
Lower ISA	WR169[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnD070503
Lower ISA	WR169[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnD070520
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnD070503
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnD070407
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnD070503
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnD070324
Lower ISA	WR169[T4]	Light Industrial	2	Light Industrial	2	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnD070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/20/2007	Comp	WLCT4C07BsnM070520
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/20/2007	Comp	WLCT4C07BsnM070520
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnM070520
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnM070324

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnM070324
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnM070503
Lower ISA	WR177[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnM070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnQ070324
Lower ISA	WR181[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnQ070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnR070503
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnR070503
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/20/2007	Comp	WLCT4C07BsnR070520
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnR070503
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnR070503

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/20/2007	Comp	WLCT4C07BsnR070520
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnR070503
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnR070503
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/7/2007	Comp	WLCT4C07BsnR070407
Lower ISA	WR183[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnR070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Unique	1	FALSE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/20/2007	Comp	WLCT4C07BsnL070520
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	WLCT4C07BsnL070503
Lower ISA	WR20[T4]	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	3/24/2007	Comp	WLCT4C07BsnL070324
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW10-WR218
Upper Study Area 1	WR218	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW20-WR218
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW20-WR22
Lower Study Area	WR22	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW30-WR22
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/23/2007	Comp	LW3-STW-CW30-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/23/2007	Comp	LW3-STW-CW30-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR384

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/18/2007	Comp	LW3-STW-CW20-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/18/2007	Comp	LW3-STW-CW20-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/23/2007	Comp	LW3-STW-CW30-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW40-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/11/2007	Comp	LW3-STW-CW50-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW40-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW30-WR384
Lower ISA	WR384	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/9/2007	Comp	LW3-STW-CW10-WR384
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW50-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW50-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW50-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW50-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW40-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW50-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW40-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	5/3/2007	Comp	LW3-STW-CW50-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/18/2007	Comp	LW3-STW-CW30-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW10-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/23/2007	Comp	LW3-STW-CW40-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	4/9/2007	Comp	LW3-STW-CW20-WR67
Middle ISA	WR67	Heavy Industrial	1	Heavy Industrial	1	Representative	2	Representative	2	TRUE	6/10/2007	Comp	LW3-STW-CW60-WR67
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW20-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR96

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	3/26/2007	Comp	LW3-STW-CW10-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW20-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial + Light Industrial	1.5	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	5/3/2007	Comp	LW3-STW-CW30-WR96

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	Location Name	Original Land Use	LUC	Rev_Land_Use	RevLUC	Location Type	LocTypeCode	RevLocType	RevLocType Code	del_Loc?	Sample Date	Collection Type	parent_sample_code
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Unique	1	TRUE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW20-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	5/3/2007	Comp	LW3-STW-CW30-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	6/10/2007	Comp	LW3-STW-CW40-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	4/23/2007	Comp	LW3-STW-CW20-WR96
Upper ISA	WR96	Heavy Industrial	1	Heavy Industrial	1	Unique	1	Representative	2	FALSE	3/26/2007	Comp	LW3-STW-CW10-WR96

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper Study Area 1	CW30-OF16	0.02	0.02		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	0.013	0.013		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	0.0091	0.0091		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW50-OF16	0.37	0.37		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW40-OF16	0.36	0.36		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	0.27	0.27		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	0.786	0.786		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW40-OF16	0.78	0.78		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW50-OF16	0.71	0.71		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	0.512	0.512		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	0.338	0.338		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	0.055	0.055		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	0.038	0.038		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	0.017	0.017		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW40-OF16	2.18	2.18		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	1.6	1.6		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper Study Area 1	CW50-OF16	0.943	0.943		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW40-OF16	55.4	55.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	39.1	39.1		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW50-OF16	22.4	22.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	21.6	21.6		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	13.4	13.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	7280	7280		1	PCB018_T	ppt	PCB018_T	3.4	0		TRUE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	3150	3150		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	2150	2150		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	2330	2330		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	1090	1090		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper Study Area 1	CW30-OF16	978	978		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	5690	5690		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	4660	4660		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	2280	2280		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	9680	9680		1	PCB153_T	ppt	PCB153_T	3.8	0		TRUE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	5800	5800		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	2750	2750		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	1430	1430		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	597	597		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	389	389		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW40-OF16	17.5	17.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	9.2	9.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	7.6	7.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	6.7	6.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-OF16	171	171		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW40-OF16	114	114		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW50-OF16	78	78		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-OF16	50	50		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW30-OF16	34	34		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	0.0165	0.0165		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	0.0064	0.0064		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	0.0046	0.0046		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	0.959	0.959		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF18	0.833	0.833		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	0.3715	0.3715		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW20-OF18	1.84	1.84		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	1.78	1.78		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	1.515	1.515		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF18	1.44	1.44		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	0.12	0.12		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	0.046	0.046		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	0.032	0.032		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	2.47	2.47		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF18	2.21	2.21		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	0.958	0.958		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	60.5	60.5		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF18	54.2	54.2		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	24.4	24.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	23.2	23.2		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	2790	2790		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	1720	1720		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	1060	1060		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	4540	4540		1	PCB066_T	ppt	PCB066_T	6.5	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	2380	2380		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	1440	1440		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	11145	11145		1	PCB106_T	ppt	PCB106_T	1.9	0		TRUE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW20-OF18	3110	3110		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	2350	2350		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	4590	4590		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	3860	3860		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	822	822		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	807	807		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF18	12.9	12.9		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	7.8	7.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	6.7	6.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	4.3	4.3		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF18	212	212		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF18	137	137		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF18	113	113		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF18	94	94		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF19	0.0235	0.0235		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	0.013	0.013		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	0.0069	0.0069		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	1.37	1.37		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-OF19	1.34	1.34		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	0.449	0.449		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-OF19	2.2	2.2		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW30-OF19	2.02	2.02		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF19	1.16	1.16		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	0.774	0.774		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF19	0.0895	0.0895		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	0.066	0.066		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	0.049	0.049		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-OF19	0.617	0.617		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	0.413	0.413		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	0.36	0.36		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-OF19	41	41		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	24	24		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	11.8	11.8		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF19	11.3	11.3		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	1450	1450		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	490	490		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF19	165	165		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	897	897		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	268	268		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF19	158	158		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	2450	2450		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	766	766		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW40-OF19	409	409		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	3490	3490		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	1480	1480		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF19	635	635		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	500	500		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	237	237		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF19	127	127		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-OF19	10.1	10.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF19	7	7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	5.9	5.9		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF19	4.7	4.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	4.1	4.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-OF19	191	191		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF19	151	151		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF19	81	81		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF19	61.5	61.5		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OF19	34	34		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	0.018	0.018		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	0.013	0.013		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	0.0045	0.00509	ND = lognormal ROS substitution	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW20-OF22	0.727	0.727		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	0.72	0.72		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	3.95	3.95		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	3.57	3.57		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	2.42	2.42		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	0.085	0.085		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	0.047	0.047		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	0.027	0.027		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	0.384	0.384		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	24.7	24.7		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	14.7	14.7		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	9.73	9.73		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	446	446		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	222	222		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	81.5	81.5		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	492	492		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	146	146		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	112	112		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	1100	1100		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	404	404		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	359	359		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	1720	1720		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	628	628		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	544	544		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	388	388		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW10-OF22	137	137		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	127	127		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	13.6	13.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	10.6	10.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	7.1	7.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22	182	182		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22	103	103		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OF22	69	69		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	0.039	0.039		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	0.027	0.027		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	2.67	2.67		1	As_D	ppb	As_D	0.00005	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	1.49	1.49		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	4.02	4.02		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	0.11	0.11		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	0.035	0.035		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	2.83	2.83		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	1.45	1.45		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	195	195		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	101	101		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	5700	5700		1	PCB018_T	ppt	PCB018_T	3.4	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	3390	3390		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	4300	4300		1	PCB066_T	ppt	PCB066_T	6.5	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	2100	2100		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	7960	7960		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	3870	3870		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	9780	9780		1	PCB153_T	ppt	PCB153_T	3.8	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	6080	6080		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OF22B	1890	1890		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	1510	1510		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	14.1	14.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW20-OF22B	266	266		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OF22B	164	164		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF22C	0.0033	0.00165	ND = 1/2 DL	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	0.00325	0.001625	ND = 1/2 DL	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	0.138	0.138		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF22C	0.202	0.202		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	0.196	0.196		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	0.00445	0.002225	ND = 1/2 DL	0	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	0.099	0.099		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	0.437	0.437		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF22C	0.403	0.403		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	38.8	38.8		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF22C	3.3	3.3		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	2.8	2.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF22C	10	10		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF22C	10	10		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	0.0045	0.00225	ND = 1/2 DL	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF49	0.0034	0.0017	ND = 1/2 DL	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	0.0033	0.00165	ND = 1/2 DL	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	0.34	0.34		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	0.47	0.47		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF49	0.291	0.291		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	0.255	0.255		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	0.0062	0.0062		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF49	0.0047	0.00235	ND = 1/2 DL	0	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	0.0044	0.0022	ND = 1/2 DL	0	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	0.345	0.345		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	4.3	4.3		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	2.75	2.75		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF49	1.39	1.39		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	37.4	37.4		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Middle ISA	CW10-OF49	53.7	53.7		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	135	135		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF49	85.7	85.7		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	31.5	31.5		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	15.6	15.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF49	6.8	6.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	5.75	5.75		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-OF49	38	38		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-OF49	16	16		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-OF49	8	8		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	0.0085	0.0085		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	0.0045	0.0045		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	0.23	0.23		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070520	0.178	0.178		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	0.102	0.102		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	0.48	0.48		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070520	0.253	0.253		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	0.251	0.251		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	0.092	0.092		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	0.024	0.024		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	0.02	0.02		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070520	0.384	0.384		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	0.353	0.353		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	0.1	0.1		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	50.4	50.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	25	25		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070520	13.8	13.8		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	BsnT070503	9250	9250		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	2870	2870		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	1570	1570		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	5760	5760		1	PCB066_T	ppt	PCB066_T	6.5	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	1640	1640		1	PCB066_T	ppt	PCB066_T	6.5	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	766	766		1	PCB066_T	ppt	PCB066_T	6.5	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	8650	8650		1	PCB106_T	ppt	PCB106_T	1.9	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	2230	2230		1	PCB106_T	ppt	PCB106_T	1.9	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	935	935		1	PCB106_T	ppt	PCB106_T	1.9	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	10100	10100		1	PCB153_T	ppt	PCB153_T	3.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	2200	2200		1	PCB153_T	ppt	PCB153_T	3.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	814	814		1	PCB153_T	ppt	PCB153_T	3.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	1690	1690		1	PCB194_T	ppt	PCB194_T	0.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	415	415		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	146	146		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	10.8	10.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	8.7	8.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	2.6	2.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070324	80	80		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070503	68	68		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnT070407	19	19		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	0.01	0.01		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	0.0058	0.0058		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	0.0057	0.0057		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	0.41	0.41		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	OF53070324	0.245	0.245		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	1.36	1.36		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	0.601	0.601		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	0.099	0.099		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	0.041	0.041		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	0.037	0.037		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	0.661	0.661		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	0.218	0.218		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	138	138		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	20.9	20.9		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	4220	4220		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	2120	2120		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	502	502		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	2670	2670		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	1290	1290		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	325	325		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	3750	3750		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	1760	1760		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	623	623		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	3580	3580		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	1770	1770		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	751	751		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	648	648		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	344	344		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	270	270		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	OF53070503	13.7	13.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	9.4	9.4		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	4	4		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070503	230	230		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070324	140	140		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	OF53070407	88	88		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	0.038	0.038		1	ACE_T	ppb	ACE_T	0.0097	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	0.019	0.019		1	ACE_T	ppb	ACE_T	0.0097	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	0.008	0.008		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM1	0.26	0.26		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	0.217	0.217		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	0.184	0.184		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM1	1.12	1.12		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	0.979	0.979		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	0.903	0.903		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	0.717	0.717		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	0.052	0.052		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	0.043	0.043		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	0.035	0.035		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM1	0.417	0.417		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	0.4	0.4		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	0.382	0.382		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	21.4	21.4		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	5.28	5.28		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM1	4.25	4.25		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	4.17	4.17		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	449	449		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	71.2	71.2		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW20-OFM1	328	328		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	96.2	96.2		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	35.1	35.1		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	353	353		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	317	317		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	110	110		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	524	524		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	428	428		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	167	167		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	104	104		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	46.9	46.9		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	30.7	30.7		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	14.1	14.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM1	13.2	13.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	11	11		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	6.1	6.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM1	97	97		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM1	73	73		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM1	49	49		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM1	46	46		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	0.011	0.011		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	0.01055	0.01055		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	0.01	0.01		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	0.0078	0.0078		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	0.34	0.34		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	0.316	0.316		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	2.27	2.27		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	1.85	1.85		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW30-OFM2	1.485	1.485		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	0.99	0.99		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	0.042	0.042		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	0.02	0.02		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	0.019	0.019		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	0.013	0.013		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	0.307	0.307		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	0.179	0.179		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	8.39	8.39		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	3.865	3.865		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	3.54	3.54		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	2.85	2.85		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	1130	1130		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	101.1	101.1		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	242	242		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	89.85	89.85		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	47.8	47.8		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	34.5	34.5		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	303	303		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	227	227		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	203	203		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	69.5	69.5		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	538	538		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW40-OFM2	302	302		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	249	249		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	97.2	97.2		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	281	281		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	71.8	71.8		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	37.2	37.2		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	11.8	11.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	6.9	6.9		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	4.7	4.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	3.2	3.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-OFM2	81	81		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-OFM2	54	54		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-OFM2	39	39		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-OFM2	31	31		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	0.024	0.024		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR107	0.011	0.011		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR107	0.009	0.009		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	0.937	0.937		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	0.23	0.23		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR107	0.211	0.211		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	1.32	1.32		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR107	0.817	0.817		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	0.631	0.631		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR107	0.271	0.271		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	0.352	0.352		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR107	0.174	0.174		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	0.076	0.076		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	7.8	7.8		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR107	4.66	4.66		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	4.35	4.35		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR107	2.79	2.79		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Middle ISA	CW40-WR107	63.1	63.1		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	44	44		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	34.5	34.5		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	190	190		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR107	36.6	36.6		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	249	249		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	156	156		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR107	50.7	50.7		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	73.4	73.4		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	29.1	29.1		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	5.6	5.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR107	4.2	4.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	3.6	3.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR107	2.9	2.9		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR107	36	36		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR107	28	28		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR107	20	20		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR107	10	10		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	0.023	0.023		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR123	0.019	0.019		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR123	0.0071	0.0071		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	1.88	1.88		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	1.45	1.45		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR123	2.74	2.74		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR123	0.078	0.078		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	0.064	0.064		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR123	0.022	0.022		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	0.556	0.556		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	0.129	0.129		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	53.3	53.3		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	CW10-WR123	23.9	23.9		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR123	17.7	17.7		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	13600	13600		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	7080	7080		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW50-WR123	767	767		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	9650	9650		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	5550	5550		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW50-WR123	834	834		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	17500	17500		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	15100	15100		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW50-WR123	2010	2010		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	19900	19900		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	18600	18600		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW50-WR123	2730	2730		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	3100	3100		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	2650	2650		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW50-WR123	469	469		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	16.1	16.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	12.1	12.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR123	9.2	9.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW50-WR123	8.8	8.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR123	366	366		1	TSS	ppm	TSS	1	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR123	317	317		1	TSS	ppm	TSS	1	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR123	143	143		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR123	89	89		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	CW50-WR123	58	58		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	0.021	0.021		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW20-WR14	0.018	0.018		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	0.0086	0.0086		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW50-WR14	0.47	0.47		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	0.364	0.364		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	0.276	0.276		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	0.706	0.706		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	0.544	0.544		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW50-WR14	0.54	0.54		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW20-WR14	0.48	0.48		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	0.271	0.271		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	0.052	0.052		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW50-WR14	0.902	0.902		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	0.456	0.456		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	0.155	0.155		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	11.4	11.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	7.99	7.99		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW50-WR14	6.7	6.7		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW20-WR14	6.11	6.11		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	2.55	2.55		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	71	71		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	56.3	56.3		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	142	142		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	69.1	69.1		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	29.1	29.1		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	537	537		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	254	254		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	561	561		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper Study Area 2	CW10-WR14	281	281		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	98.1	98.1		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	85.2	85.2		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	42.5	42.5		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW50-WR14	11.1	11.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	6.4	6.4		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW20-WR14	6.3	6.3		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	4.1	4.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW10-WR14	51	51		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW40-WR14	47	47		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW50-WR14	42	42		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW20-WR14	40	40		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 2	CW30-WR14	12	12		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR145	0.019	0.019		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	0.016	0.016		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	0.66	0.66		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	0.87	0.87		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR145	0.022	0.022		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	0.0046	0.005374	ND = lognormal ROS substitution	0	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR145	7.01	7.01		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	1.16	1.16		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	27.9	27.9		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	94.2	94.2		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	88.5	88.5		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR145	8.1	8.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR145	9	9		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR142	8	8		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	0.02	0.02		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW20-WR147	0.017	0.017		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	0.0092	0.0092		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR147	0.316	0.316		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-WR147	0.28	0.28		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR147	0.265	0.265		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR147	1.07	1.07		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR147	0.931	0.931		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	0.628	0.628		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-WR147	0.41	0.41		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	0.378	0.378		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR147	0.015	0.015		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	0.013	0.013		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	0.0054	0.0054		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR147	6.14	6.14		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR147	2.34	2.34		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW50-WR147	1.35	1.35		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	34.8	34.8		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	25.5	25.5		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-WR147	14.6	14.6		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR147	3750	3750		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	966	966		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	910	910		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR147	6390	6390		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	2080	2080		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	1200	1200		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	14800	14800		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	9380	9380		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	19600	19600		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	11200	11200		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW20-WR147	40400	40400		1	PCB194_T	ppt	PCB194_T	0.8	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	13700	13700		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	6010	6010		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-WR147	13.1	13.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR147	11.7	11.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	7.1	7.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	5.5	5.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR147	119	119		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR147	60	60		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR147	28	28		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR147	19	19		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW50-WR147	15	15		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	0.012	0.012		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	0.011	0.011		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	0.0093	0.0093		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	1.19	1.19		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	0.717	0.717		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	0.622	0.622		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	1.82	1.82		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	1.62	1.62		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	1.46	1.46		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	1.1	1.1		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	0.032	0.032		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	0.028	0.028		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	0.019	0.019		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	0.565	0.565		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	0.52	0.52		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	0.389	0.389		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	17.5	17.5		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	12.1	12.1		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	11.4	11.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	177	177		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	72.9	72.9		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW40-WR161	66.7	66.7		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	451	451		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	160	160		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	153	153		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	4290	4290		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	3060	3060		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	1990	1990		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	17000	17000		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	12100	12100		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	7950	7950		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	3670	3670		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	2690	2690		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	14.2	14.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	13.3	13.3		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	8.9	8.9		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	4.1	4.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR161	256	256		1	TSS	ppm	TSS	1	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR161	117	117		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR161	23	23		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR161	22	22		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070407	0.0053	0.0053		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070324	0.0042	0.0042		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070520	0.202	0.202		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070503	0.18	0.18		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070324	0.085	0.085		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070520	0.265	0.265		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070503	0.265	0.265		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	BsnD070324	0.139	0.139		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070407	0.054	0.054		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070324	0.052	0.052		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070503	0.02	0.02		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070324	0.168	0.168		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070503	38.9	38.9		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnD070324	31.4	31.4		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnD070520	26.2	26.2		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnD070503	10	10		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070407	5.8	5.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070324	2.2	2.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070503	19	19		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070324	14	14		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnD070407	6	6		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	0.035	0.035		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	0.027	0.027		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	3.16	3.16		1	As_D	ppb	As_D	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	3	3		1	As_D	ppb	As_D	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070520	2.95	2.95		1	As_D	ppb	As_D	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	3.67	3.67		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070520	3.39	3.39		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	3.27	3.27		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	0.36	0.36		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	0.19	0.19		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	0.15	0.15		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	0.35	0.35		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	36.1	36.1		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070520	26.4	26.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	497	497		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	BsnM070503	197	197		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	162	162		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	1680	1680		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	861	861		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	652	652		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	39500	39500		1	PCB106_T	ppt	PCB106_T	1.9	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	15800	15800		1	PCB106_T	ppt	PCB106_T	1.9	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	2840	2840		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	36200	36200		1	PCB153_T	ppt	PCB153_T	3.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	15000	15000		1	PCB153_T	ppt	PCB153_T	3.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	6830	6830		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	1250	1250		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	760	760		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	721	721		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	18.3	18.3		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	11.5	11.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	4.8	4.8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070324	117	117		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070503	66	66		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnM070407	35	35		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	0.013	0.013		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	0.0053	0.0053		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	0.145	0.145		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	0.404	0.404		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	0.078	0.078		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	BsnQ070324	0.15	0.15		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	16.5	16.5		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	2440	2440		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	924	924		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	1780	1780		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	727	727		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	2930	2930		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	1120	1120		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	3450	3450		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	1390	1390		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	598	598		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	207	207		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	7.6	7.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	3.5	3.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070324	89	89		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnQ070407	15	15		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070503	0.025	0.025		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070503	0.53	0.53		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	0.188	0.188		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	0.375	0.375		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	0.017	0.017		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	0.0077	0.0077		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070520	6.11	6.11		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnR070503	4.35	4.35		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	0.586	0.586		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070503	2480	2480		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	BsnR070520	1070	1070		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	9.26	9.26		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070503	41400	41400		1	PCB018_T	ppt	PCB018_T	3.4	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	1770	1770		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	1060	1060		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	1700	1700		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	572	572		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	1940	1940		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	738	738		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	1500	1500		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	607	607		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	294	294		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	120	120		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	166	166		1	TOC	ppm	TOC	0.07	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnR070503	54.6	54.6		1	TOC	ppm	TOC	0.07	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	48.3	48.3		1	TOC	ppm	TOC	0.07	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnR070407	90	90		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnR070324	50	50		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	0.032	0.032		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	0.029	0.029		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	0.013	0.013		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	2.38	2.38		1	As_D	ppb	As_D	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	0.898	0.898		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	0.22	0.22		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	1.64	1.64		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	0.803	0.803		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	BsnL070520	3.7	3.7		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	2.2	2.2		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	2	2		1	BAP_T	ppb	BAP_T	0.0087	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	0.36	0.36		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	0.328	0.328		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	0.111	0.111		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	50.3	50.3		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	43	43		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	31	31		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	5320	5320		1	PCB018_T	ppt	PCB018_T	3.4	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	1600	1600		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	1420	1420		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	8270	8270		1	PCB066_T	ppt	PCB066_T	6.5	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	2130	2130		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	2020	2020		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	5820	5820		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	3450	3450		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	3030	3030		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	5910	5910		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	5280	5280		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	5080	5080		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	982	982		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	BsnL070520	958	958		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	813	813		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	19.5	19.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	4.5	4.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070520	309	309		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070503	207	207		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	BsnL070324	108	108		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	0.022	0.022		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	0.014	0.014		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	0.36	0.36		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	0.345	0.345		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	1.34	1.34		1	As_T	ppb	As_T	0.00005	0		TRUE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	0.94	0.94		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	0.023	0.023		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	0.015	0.015		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	0.299	0.299		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	19.5	19.5		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	5.67	5.67		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	182	182		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	101	101		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	646	646		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	285	285		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	2360	2360		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	724	724		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	2250	2250		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	770	770		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper Study Area 1	CW10-WR218	428	428		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	156	156		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	21.5	21.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	7.1	7.1		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW10-WR218	77	77		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper Study Area 1	CW20-WR218	28	28		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	0.023	0.023		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	0.017	0.017		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	1.78	1.78		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW40-WR22	1.6	1.6		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	1.48	1.48		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	4.16	4.16		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	0.028	0.028		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	0.028	0.028		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	0.01	0.01		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	0.53	0.53		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW40-WR22	0.454	0.454		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	0.116	0.116		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	56.1	56.1		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower Study Area	CW40-WR22	56	56		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	42	42		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	39.1	39.1		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	6800	6800		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	6590	6590		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	5300	5300		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	10600	10600		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	8160	8160		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	6660	6660		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	9920	9920		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower Study Area	CW10-WR22	8000	8000		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	7260	7260		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	7580	7580		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	6170	6170		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	6110	6110		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	1020	1020		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	860	860		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	719	719		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW40-WR22	7.6	7.6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	6	6		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	4.2	4.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	3.2	3.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW40-WR22	221	221		1	TSS	ppm	TSS	1	0		TRUE	FALSE	FALSE	FALSE
Lower Study Area	CW10-WR22	146	146		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW20-WR22	143	143		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower Study Area	CW30-WR22	128	128		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	0.0034	0.003828	ND = lognormal ROS substitution	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR384	0.885	0.885		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR384	0.82	0.82		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR384	2.88	2.88		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR384	2.29	2.29		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	1.5	1.5		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR384	1.49	1.49		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	0.016	0.016		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR384	7.47	7.47		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR384	6.59	6.59		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR384	635	635		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR384	580	580		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR384	285	285		1	Pb_T	ppb	Pb_T	0.00001	0		TRUE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Lower ISA	CW10-WR384	6.22	6.22		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR384	329000	329000		1	PCB018_T	ppt	PCB018_T	3.4	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR384	171000	171000		1	PCB018_T	ppt	PCB018_T	3.4	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR384	88800	88800		1	PCB018_T	ppt	PCB018_T	3.4	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	6710	6710		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	1540	1540		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	2150	2150		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	2130	2130		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW20-WR384	78000	78000		1	PCB194_T	ppt	PCB194_T	0.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR384	35200	35200		1	PCB194_T	ppt	PCB194_T	0.8	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR384	15800	15800		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	343	343		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	21.7	21.7		1	TOC	ppm	TOC	0.07	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW50-WR384	304	304		1	TSS	ppm	TSS	1	0		TRUE	FALSE	FALSE	FALSE
Lower ISA	CW40-WR384	167	167		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW30-WR384	64	64		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Lower ISA	CW10-WR384	6	6		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	0.037	0.037		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	0.015	0.015		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	0.0089	0.0089		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	0.0042	0.0042		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	0.18	0.18		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW50-WR67	0.17	0.17		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	0.106	0.106		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	0.024	0.024		1	As_D	ppb	As_D	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW50-WR67	0.594	0.594		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	0.408	0.408		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	0.225	0.225		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Middle ISA	CW60-WR67	0.2	0.2		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	0.134	0.134		1	As_T	ppb	As_T	0.00005	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	0.078	0.078		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	0.046	0.046		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	0.037	0.037		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	0.021	0.021		1	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW50-WR67	0.212	0.212		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	0.107	0.107		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	0.071	0.071		1	Pb_D	ppb	Pb_D	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW50-WR67	9.27	9.27		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	4.25	4.25		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	1.67	1.67		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	1.27	1.27		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	0.616	0.616		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	59.3	59.3		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	33.5	33.5		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	31.5	31.5		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	77.9	77.9		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	36.2	36.2		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	222	222		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	108	108		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	50.7	50.7		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	25.8	25.8		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Middle ISA	CW30-WR67	306	306		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	126	126		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR67	103	103		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	69.6	69.6		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	35.1	35.1		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	68.1	68.1		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW50-WR67	15.4	15.4		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	11.2	11.2		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR67	9.3	9.3		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	8	8		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	6.9	6.9		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	4.3	4.3		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW50-WR67	59	59		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW30-WR67	49	49		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW10-WR67	22	22		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW40-WR67	15	15		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW20-WR67	14	14		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Middle ISA	CW60-WR67	6	6		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR96	0.0044	0.0044		1	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	0.0034	0.004726	ND = lognormal ROS substitution	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR96	0.0031	0.004316	ND = lognormal ROS substitution	0	ACE_T	ppb	ACE_T	0.0097	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW30-WR96	0.0047	0.005374	ND = lognormal ROS substitution	0	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR96	0.0043	0.005374	ND = lognormal ROS substitution	0	BAP_T	ppb	BAP_T	0.0087	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	10.6	10.6		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	10.1	10.1		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR96	3.91	3.91		1	Pb_D	ppb	Pb_D	0.00001	0		TRUE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	15.3	15.3		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	14.6	14.6		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR96	12.4	12.4		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR96	8.47	8.47		1	Pb_T	ppb	Pb_T	0.00001	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	410	410		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	183	183		1	PCB018_T	ppt	PCB018_T	3.4	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	653	653		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	255	255		1	PCB066_T	ppt	PCB066_T	6.5	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	718	718		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	300	300		1	PCB106_T	ppt	PCB106_T	1.9	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	400	400		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	215	215		1	PCB153_T	ppt	PCB153_T	3.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	138	138		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE

Table 5-22. Summary of Sample Counts and Concentration Ranges for Data Set.

River Reach	systat_samp	Result	Result_ND_sub	ND_treatment	D_Result	ChemID	Units	ChemID	TargetDLs	ND_Result>TargetDL?	ND_Result>TargetDL?equation	Orig_Outlier	Rev_Outlier	StormCorr_Original	StormCorr_Reclassified
Upper ISA	CW40-WR96	67.5	67.5		1	PCB194_T	ppt	PCB194_T	0.8	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	8.4	8.4		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR96	5.7	5.7		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR96	4.5	4.5		1	TOC	ppm	TOC	0.07	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW30-WR96	20	20		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW40-WR96	11	11		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW20-WR96	6	6		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE
Upper ISA	CW10-WR96	5	5		1	TSS	ppm	TSS	1	0		FALSE	FALSE	FALSE	FALSE

Note:

T4- Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Table 5-23. Data Summary for Stormwater Parameters Based on Revised Land Use Code and Unique Stations
(Revised Outliers Excluded; High ND Excluded [a]; Substitution Applied to ND Values[b])

				Heavy Industrial (unique)				Heavy Industrial (representative)							
ChemID	**Chemical Name**	**Fraction**	**Units**	n_{det}	**Minimum (detected)**	**Maximum (detected)**	**Mean (detected)**	n_{det}	**Minimum (detected)**	**Maximum (detected)**	**Mean (detected)**	n_{nd}	**Minimum (nondetect)**	**Maximum (nondetect)**	**Mean (nondetect)**
ACE_T	Acenaphthene	total	µg/L					41	0.0042	0.039	0.02	4	0.0038	0.0051	0.0045
As_D	Arsenic	dissolved	µg/L	30	0.211	3.16	1.15	12	0.024	0.53	0.25				
As_T	Arsenic	total	µg/L	32	0.271	4.16	1.73								
BAP_T	Benzo(a)pyrene	total	µg/L	6	0.15	3.7	1.43	32	0.0054	0.11	0.04	3	0.0054	0.0054	0.0054
Pb_D	Lead	dissolved	µg/L	30	0.076	10.6	2.46								
Pb_T	Lead	total	µg/L	9	6.22	2480	595.72								
PCB018_T	PCB018	total	pg/L												
PCB066_T	PCB066 & 076	total	pg/L												
PCB106_T	PCB106 & 118	total	pg/L	3	2840	39500	19380.00	40	25.8	17500	3660.78				
PCB153_T	PCB153	total	pg/L	3	6830	36200	19343.33	42	35.1	19900	4501.86				
PCB194_T	PCB194	total	pg/L	24	29.1	78000	9017.36								
TOC	Total organic carbon	NA	mg/L	3	48.3	166	89.63	52	2.9	21.7	9.18				
TSS	Total suspended solids	NA	mg/L					65	5	366	88.35				

Notes:

Total n Total number of samples.
n_{det} Number of detected values.
n_{nd} Number of nondetect values.

a - High ND: Any nondetect value > the target detection limit
b - Substitution was applied to nondetect values according to the following rules:
n >/= 8 : Create extrapolated non-detect values using ProUCL.
n < 8 : Use ½ DL

Table 5-23. Data Summary for Stormwater Parameters Based on Revised Land Use Code and Unique Stations
(Revised Outliers Excluded; High ND Excluded [a]; Substitution Applied to

				Heavy Industrial + Light Industrial (representative)				Light Industrial (representative)			
ChemID	**Chemical Name**	**Fraction**	**Units**	**n_{det}**	**Minimum (detected)**	**Maximum (detected)**	**Mean (detected)**	**n_{det}**	**Minimum (detected)**	**Maximum (detected)**	**Mean (detected)**
ACE_T	Acenaphthene	total	µg/L					11	0.0042	0.038	0.012
As_D	Arsenic	dissolved	µg/L					11	0.085	0.34	0.209
As_T	Arsenic	total	µg/L	30	0.134	2.27	0.739				
BAP_T	Benzo(a)pyrene	total	µg/L					13	0.013	0.092	0.037
Pb_D	Lead	dissolved	µg/L	19	0.071	0.417	0.266				
Pb_T	Lead	total	µg/L	63	0.616	56.1	19.100				
PCB018_T	PCB018	total	pg/L	52	31.5	329000	14181.367				
PCB066_T	PCB066 & 076	total	pg/L	53	27.9	10600	1824.663				
PCB106_T	PCB106 & 118	total	pg/L					10	69.5	8650	1339.750
PCB153_T	PCB153	total	pg/L					10	97.2	10100	1541.920
PCB194_T	PCB194	total	pg/L	28	30.7	1690	473.061				
TOC	Total organic carbon	NA	mg/L					14	2.2	14.1	7.936
TSS	Total suspended solids	NA	mg/L					14	6	97	48.286

Notes:

Total n — Total number of samples.
n_{det} — Number of detected values.
n_{nd} — Number of nondetect values.

a - High ND: Any nondetect value > the target detection limit
b - Substitution was applied to nondetect values according to the following rules:
n >/= 8 : Create extrapolated non-detect values using ProUCL.
n < 8 : Use ½ DL

Table 5-23. Data Summary for Stormwater Parameters Based on Revised Land Use Code and Unique Stations
(Revised Outliers Excluded; High ND Excluded [a]; Substitution Applied to

ChemID	Chemical Name	Fraction	Units	Open Space (representative)							
				n_{det}	Minimum (detected)	Maximum (detected)	Mean (detected)	n_{nd}	Minimum (nondetect)	Maximum (nondetect)	Mean (nondetect)
ACE_T	Acenaphthene	total	µg/L					2	0.0016	0.0017	0.0016
As_D	Arsenic	dissolved	µg/L	1	0.138	0.138	0.138				
As_T	Arsenic	total	µg/L	2	0.196	0.202	0.199				
BAP_T	Benzo(a)pyrene	total	µg/L					1	0.0022	0.0022	0.0022
Pb_D	Lead	dissolved	µg/L	1	0.099	0.099	0.099				
Pb_T	Lead	total	µg/L	2	0.403	0.437	0.42				
PCB018_T	PCB018	total	pg/L								
PCB066_T	PCB066 & 076	total	pg/L								
PCB106_T	PCB106 & 118	total	pg/L								
PCB153_T	PCB153	total	pg/L	1	38.8	38.8	38.8				
PCB194_T	PCB194	total	pg/L								
TOC	Total organic carbon	NA	mg/L	2	2.8	3.3	3.05				
TSS	Total suspended solids	NA	mg/L	2	10	10	10				

Notes:
Total n Total number of samples.
n_{det} Number of detected values.
n_{nd} Number of nondetect values.
a - High ND: Any nondetect value > the target detection limit
b - Substitution was applied to nondetect values according to the following rules:
n >/= 8 : Create extrapolated non-detect values using ProUCL.
n < 8 : Use ½ DL

Table 5-23. Data Summary for Stormwater Parameters Based on Revised Land Use Code and Unique Stations
(Revised Outliers Excluded; High ND Excluded [a]; Substitution Applied to

ChemID	Chemical Name	Fraction	Units	Open Space / Heavy Industrial (multiple)				Residential (representative)							
				n_{det}	Minimum (detected)	Maximum (detected)	Mean (detected)	n_{det}	Minimum (detected)	Maximum (detected)	Mean (detected)	n_{nd}	Minimum (nondetect)	Maximum (nondetect)	Mean (nondetect)
ACE_T	Acenaphthene	total	µg/L	6	0.0046	0.0235	0.012	3	0.0057	0.01	0.0072	3	0.0017	0.0023	0.0019
As_D	Arsenic	dissolved	µg/L	6	0.3715	1.37	0.887	3	0.245	0.41	0.3317				
As_T	Arsenic	total	µg/L	8	0.774	2.2	1.591	5	0.255	1.36	0.5954				
BAP_T	Benzo(a)pyrene	total	µg/L	6	0.032	0.12	0.067	4	0.0062	0.099	0.0458	2	0.0022	0.0024	0.0023
Pb_D	Lead	dissolved	µg/L	6	0.36	2.47	1.171	3	0.218	0.661	0.4080				
Pb_T	Lead	total	µg/L	8	11.3	60.5	31.300	5	1.39	138	33.4680				
PCB018_T	PCB018	total	pg/L	6	165	2790	1279.167	3	502	4220	2280.6667				
PCB066_T	PCB066 & 076	total	pg/L	6	158	4540	1613.833	4	37.4	2670	1080.6000				
PCB106_T	PCB106 & 118	total	pg/L	6	409	11145	3371.667	4	53.7	3750	1546.6750				
PCB153_T	PCB153	total	pg/L	5	635	4590	2811.000	5	85.7	3580	1264.3400				
PCB194_T	PCB194	total	pg/L	5	127	822	498.600	4	31.5	648	323.3750				
TOC	Total organic carbon	NA	mg/L	9	4.1	12.9	7.056	6	4	15.6	9.2083				
TSS	Total suspended solids	NA	mg/L	9	34	212	119.389	6	8	230	86.6667				

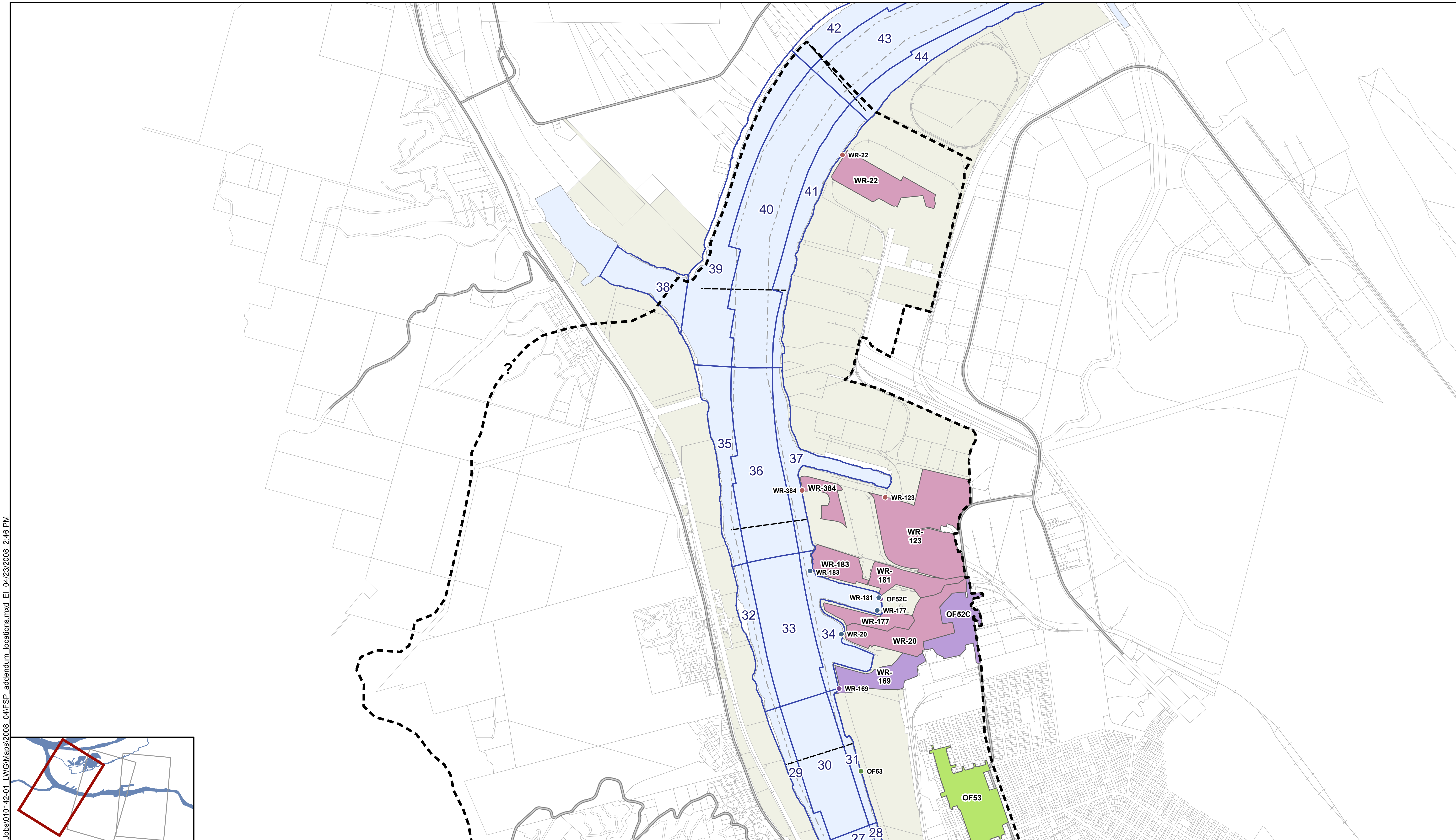
Notes:
Total n Total number of samples.
n_{det} Number of detected values.
n_{nd} Number of nondetect values.
a - High ND: Any nondetect value > the target detection limit
b - Substitution was applied to nondetect values according to the following rules:
n >/= 8 : Create extrapolated non-detect values using ProUCL.
n < 8 : Use ½ DL

Table 5-24. Flow Volumes (in liters) Required for Each Month

Land Use Type		Cell 1	Cell 3	Cell 4	Cell 6	Cell 7	Cell 9	Cell 10	Cell 12	Cell 13	Cell 15	Cell 16	Cell 17	Cell 19	Cell 20	Cell 22	Cell 23	Cell 25	Cell 26	Cell 28	Cell 29	Cell 31	Cell 32	Cell 34	Cell 35	Cell 37	Cell 38	Cell 39	Cell 41	Cell 42	Cell 44
Heavy Industrial		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Light Industrial		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Residential*		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Open Space/Vacant Land		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Major Transportation		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WR-22	OSM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-
WR-123	Schnitzer International Slip	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-
WR-384	Schnitzer - Riverside	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-
WR-107	GASCO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-96	Arkema	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-14	Chevron - Transportation	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-161	Portland Shipyard	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-4	Sulzer Pump	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-145/142	Gunderson	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-147	Gunderson (former Schnitzer)	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drains to OF-17	GE Decommissioning	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hwy 30 "A"	Hwy 30	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hwy 30 "B"[1]	Hwy 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-49	City - St. Johns Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-67	Siltronic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-22C	City - Forest Park Area	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-22B	City - Doane Lk. Indus.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-M1, above Devine	City - Mocks Bottom	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-M2	City - Mocks Bottom	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-22	City - Willbridge Industrial	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OF-16	City - Heavy Industrial	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WR-218	UPRR Albina	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
St. Johns Bridge	Highway drainage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-	-	-	-
OF-52C/Basin T[T4]	City - Terminal 4 Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-
OF-53[T4]	City - Residential above T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-
WR-183/Basin R[T4]	Terminal 4 - Slip 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-
WR-181/Basin Q[T4]	Terminal 4 - Slip 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-
WR-177/Basin M[T4]	Terminal 4 - Slip 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-
WR-20/Basin L[T4]	Terminal 4 - Wheeler Bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-
WR-169/Basin D[T4]	Terminal 4 (Toyota)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Z	-	-	-	-	-	-	-	-	-

Notes:
*Any commercial areas will be lumped with residential
X = Total volume of runoff from this land use (minus any unique sites) within designated segment watershed in liters for this month and year's precipitation.
Z = Total volume of runoff from this unique site in liters for this months and year's precipitation.
- = Site not within this segment watershed.
1 - Hwy30 "B" does not drain to the river, it drains to the sanitary sewer overflow tunnel
Note that the cells each basin drains to the river are estimated and will be confirmed by the City of Portland.
T4- Sampled as part of the Port of Portland Terminal 4 Recontamination Study.

Figures



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N

0 500 1,000 1,500 2,000 Feet

Map Features:

2007 Stormwater Sampling Location
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

2007 Stormwater Sampling Basin Land Use
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- Hybrid Model Cells
- Approx. Drainage Boundary
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

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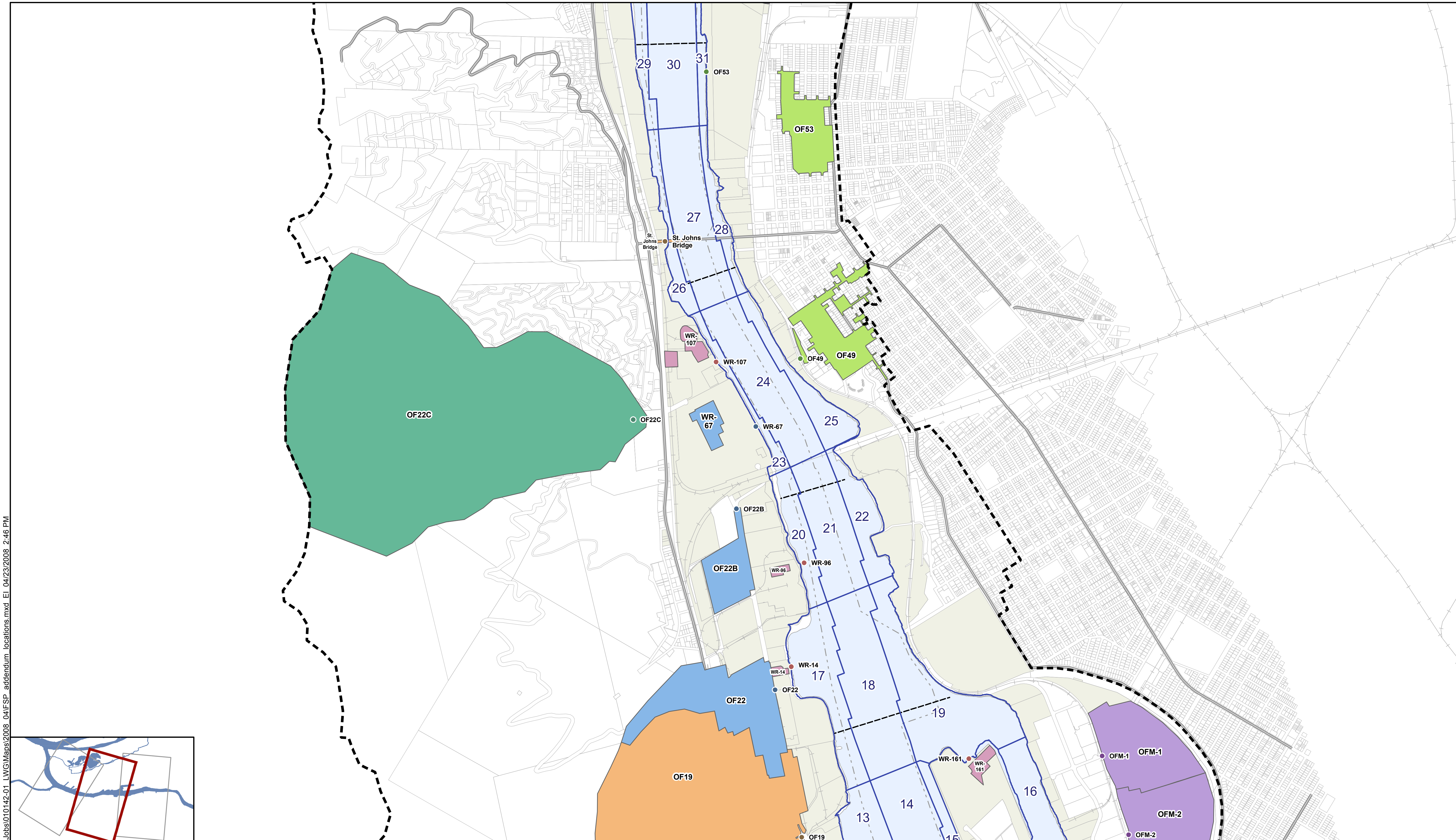
Figure 4-1a
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
River Mile 02 to 05



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N

0 500 1,000 1,500 2,000 Feet

Map Features:

2007 Stormwater Sampling Location
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

2007 Stormwater Sampling Basin Land Use
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- Hybrid Model Cells
- Approx. Drainage Boundary
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

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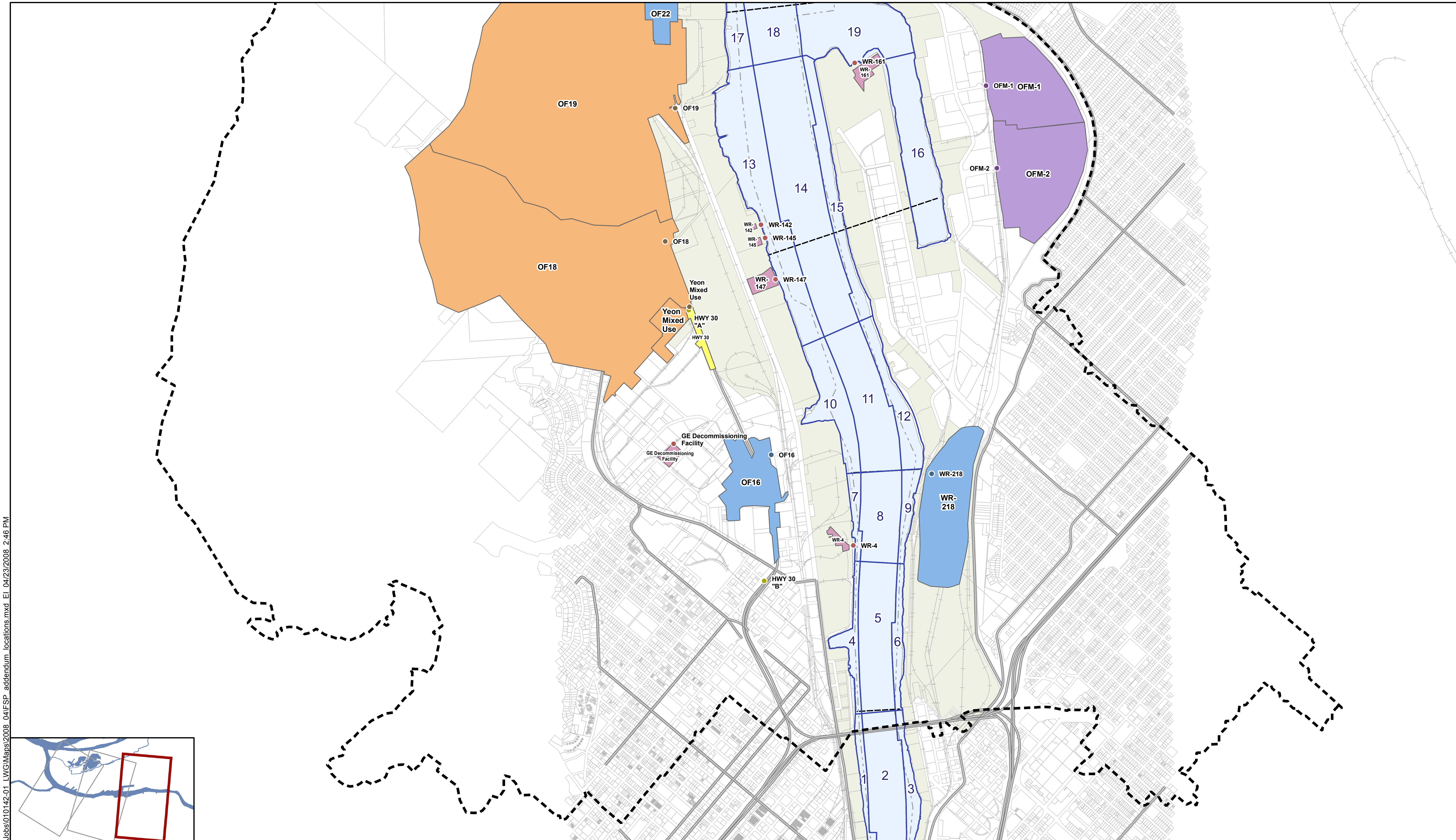
Figure 4-1b
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
River Mile 05 to 08



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0 500 1,000 1,500 2,000 Feet

Map Features:

2007 Stormwater Sampling Location
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

2007 Stormwater Sampling Basin Land Use
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- Hybrid Model Cells
- Approx. Drainage Boundary
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

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Figure 4-1c
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
River Mile 08 to 11

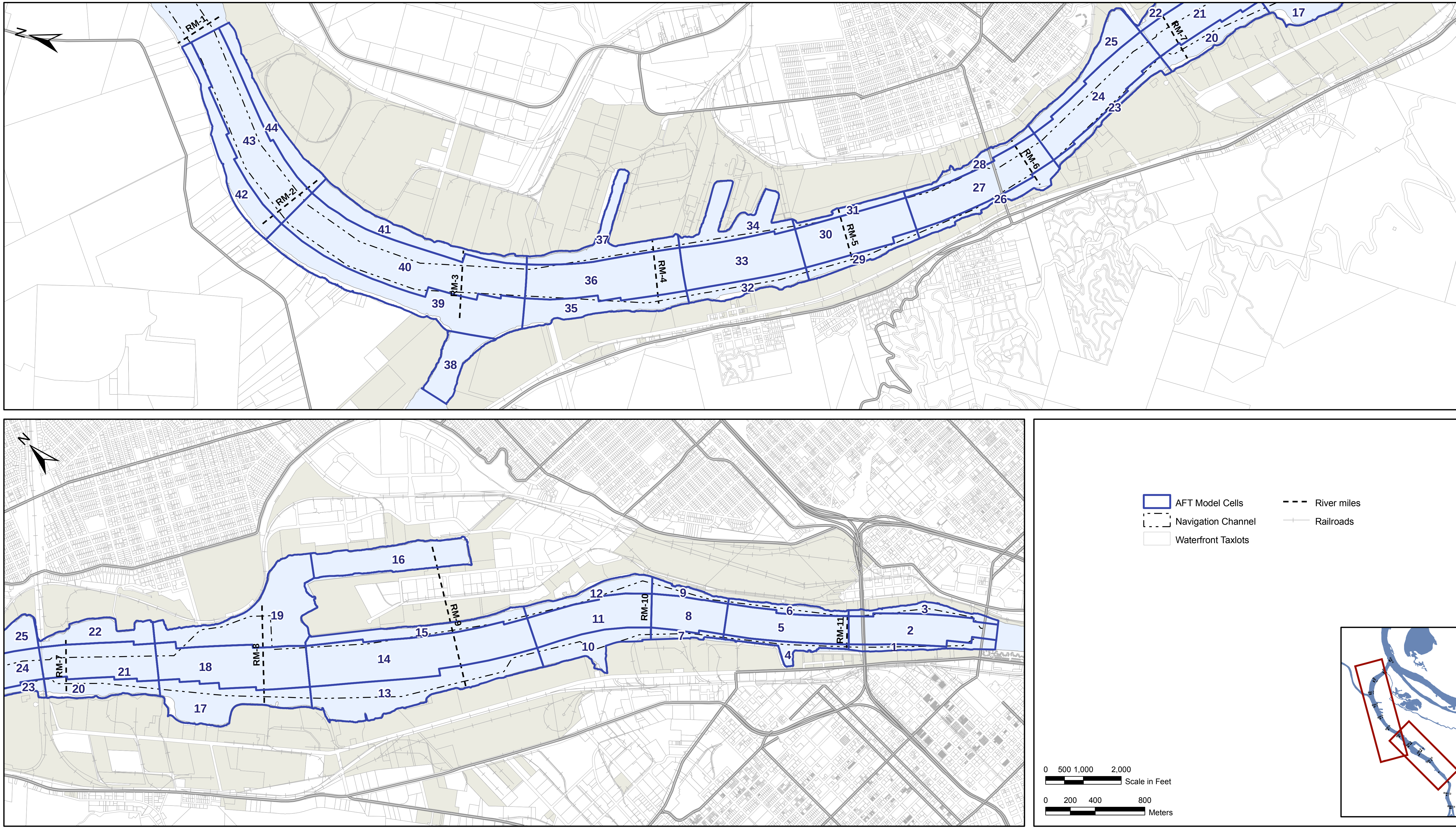

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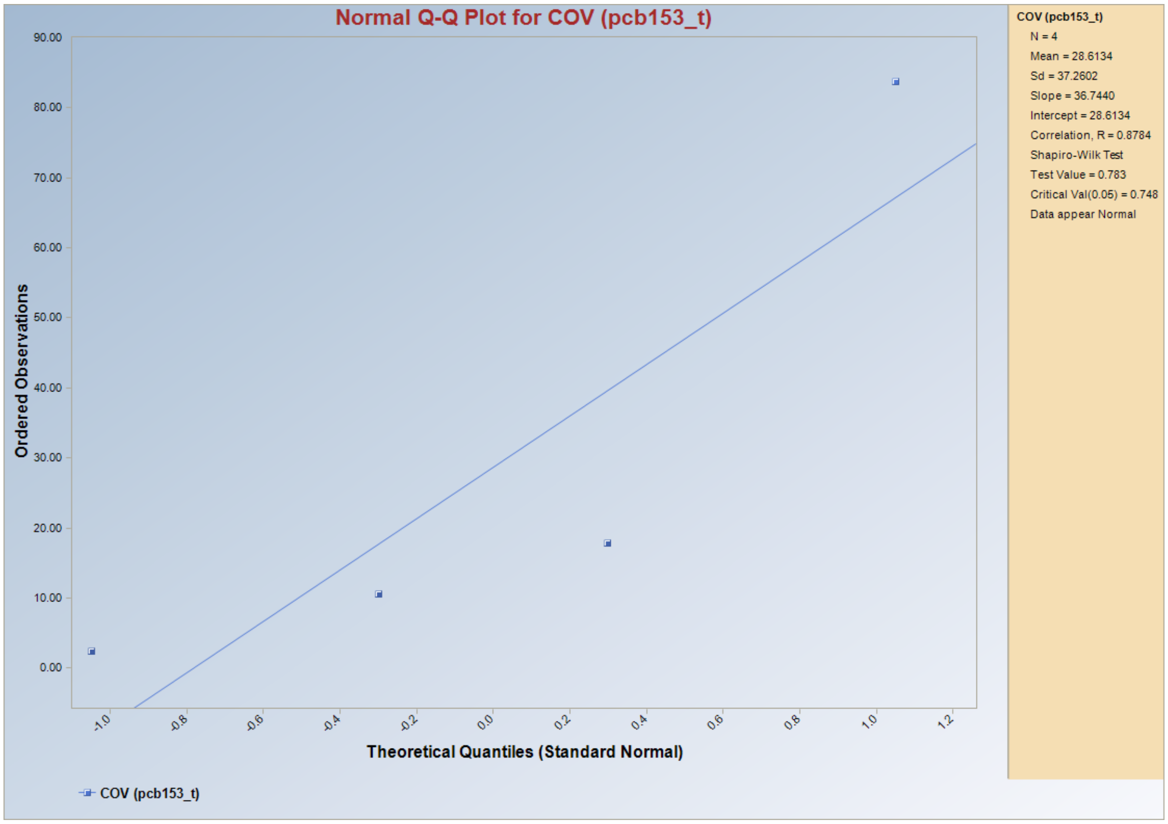
Figure 4-2
Portland Harbor RI/FS
Stormwater Loading Calculation Methods
Hybrid Model Domain and Cells
River Mile 02 to 11



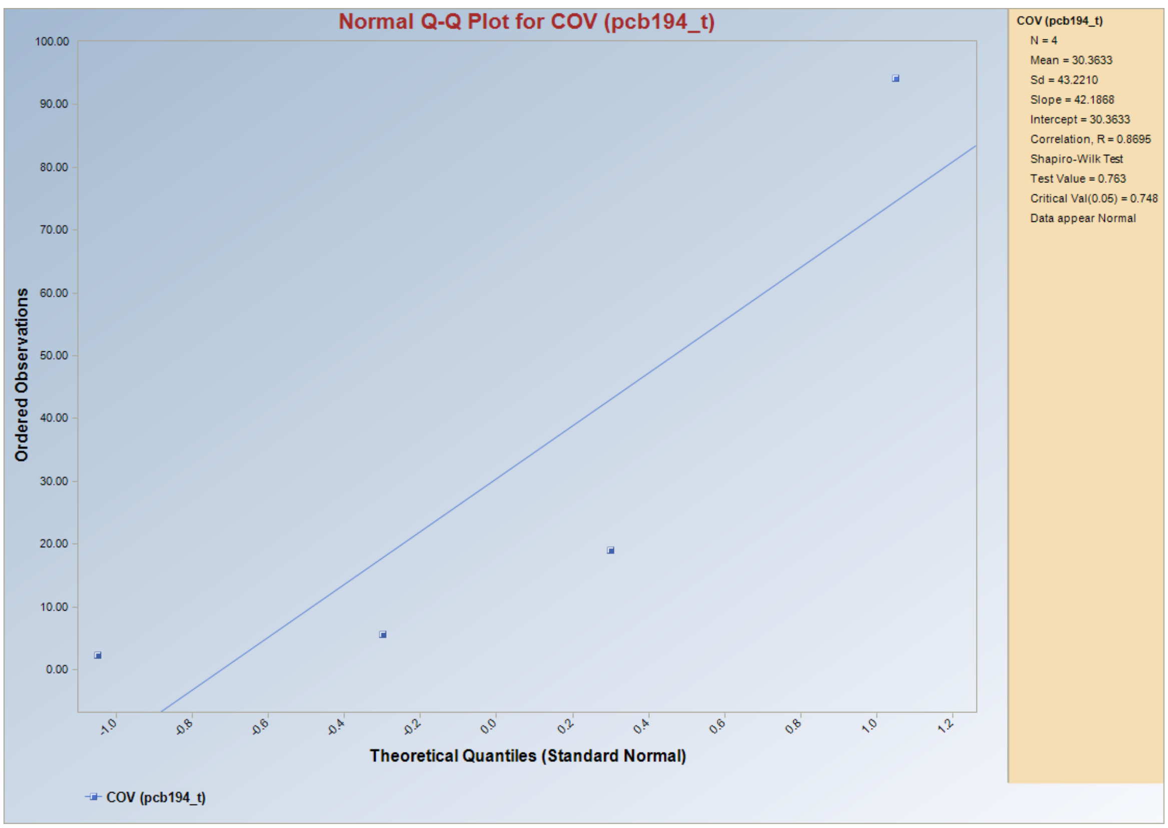
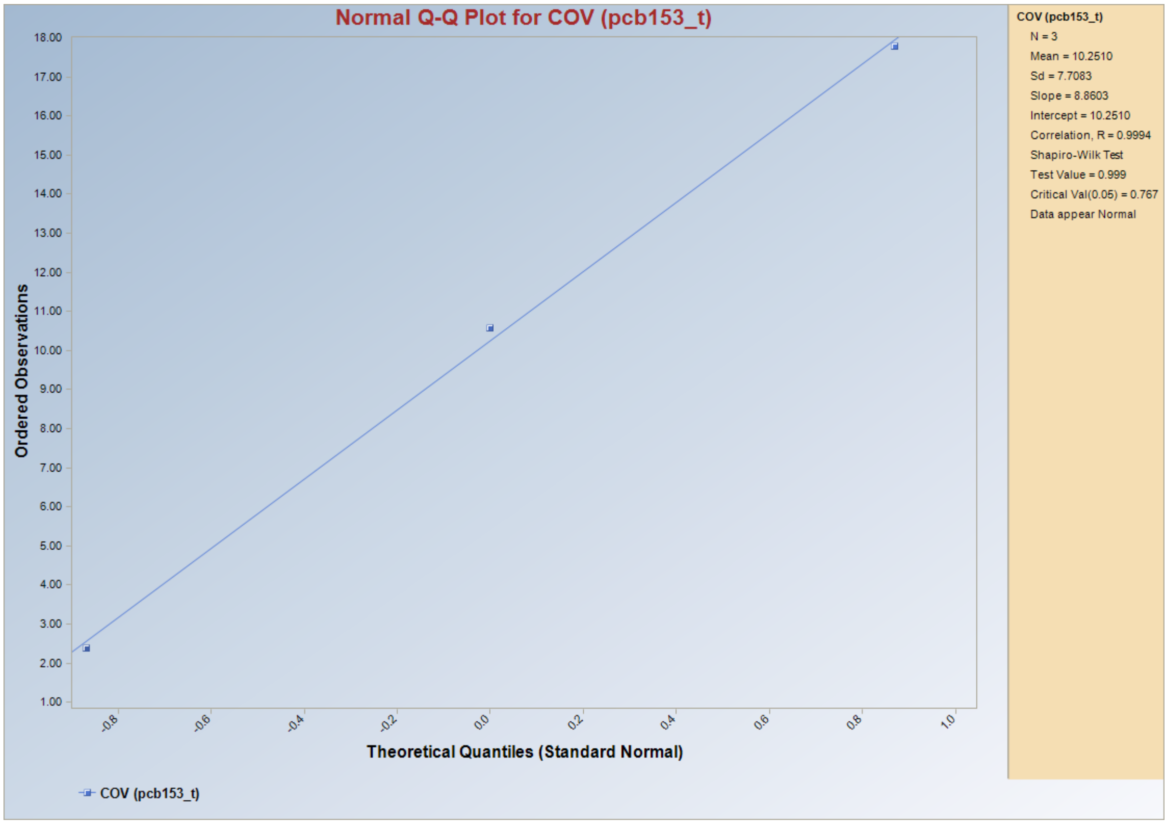


Figure 5-1
Example QQ-Plots and GOF Tests of COV for Duplicate Samples
Stormwater Loading Calculations Methods



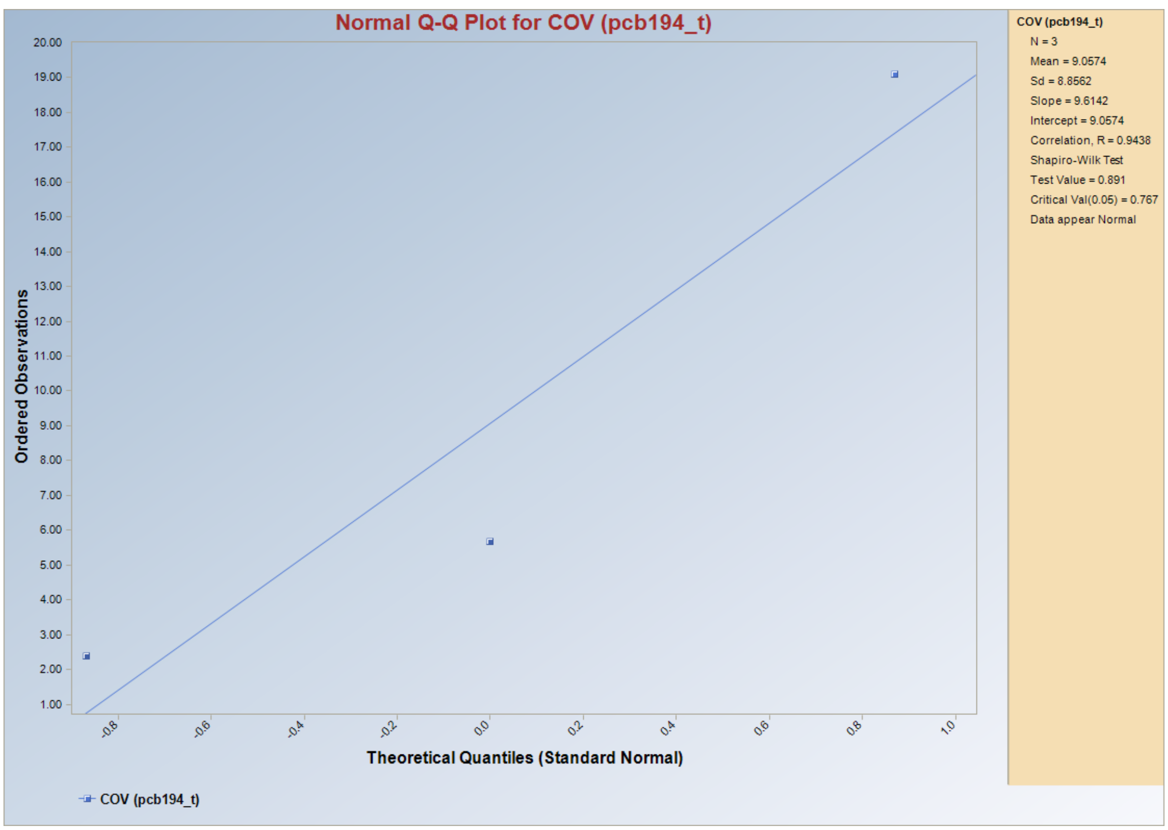


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Figure 5-2
Example QQ-Plots and GOF Tests of COV with Outliers Removed from Duplicate Samples
Stormwater Loading Calculations Methods

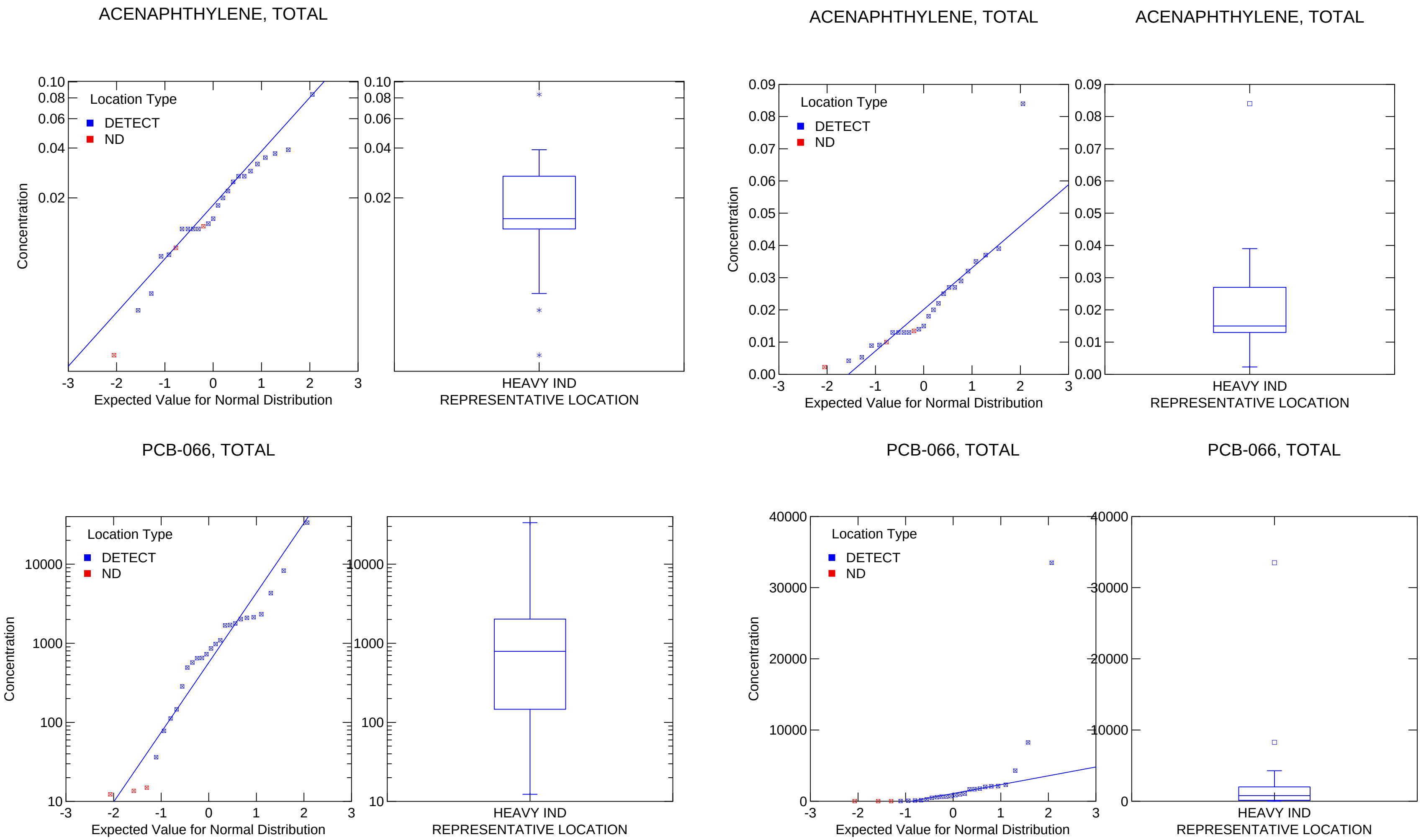

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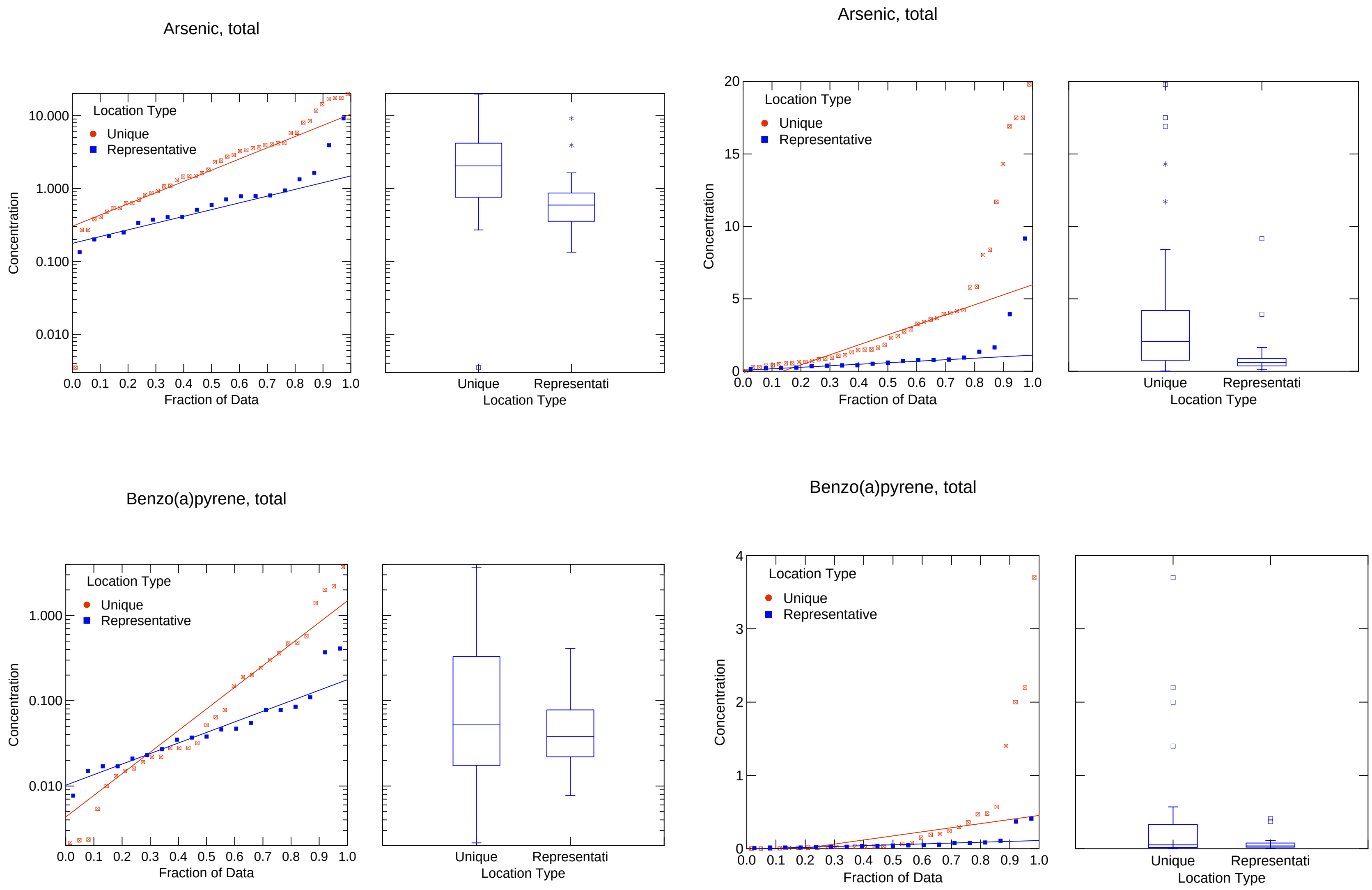
Figure 5-3
Example Graphical Evaluations of Representative Heavy Industrial Data Distributions for Outlier Analysis
Stormwater Loading Calculations Methods



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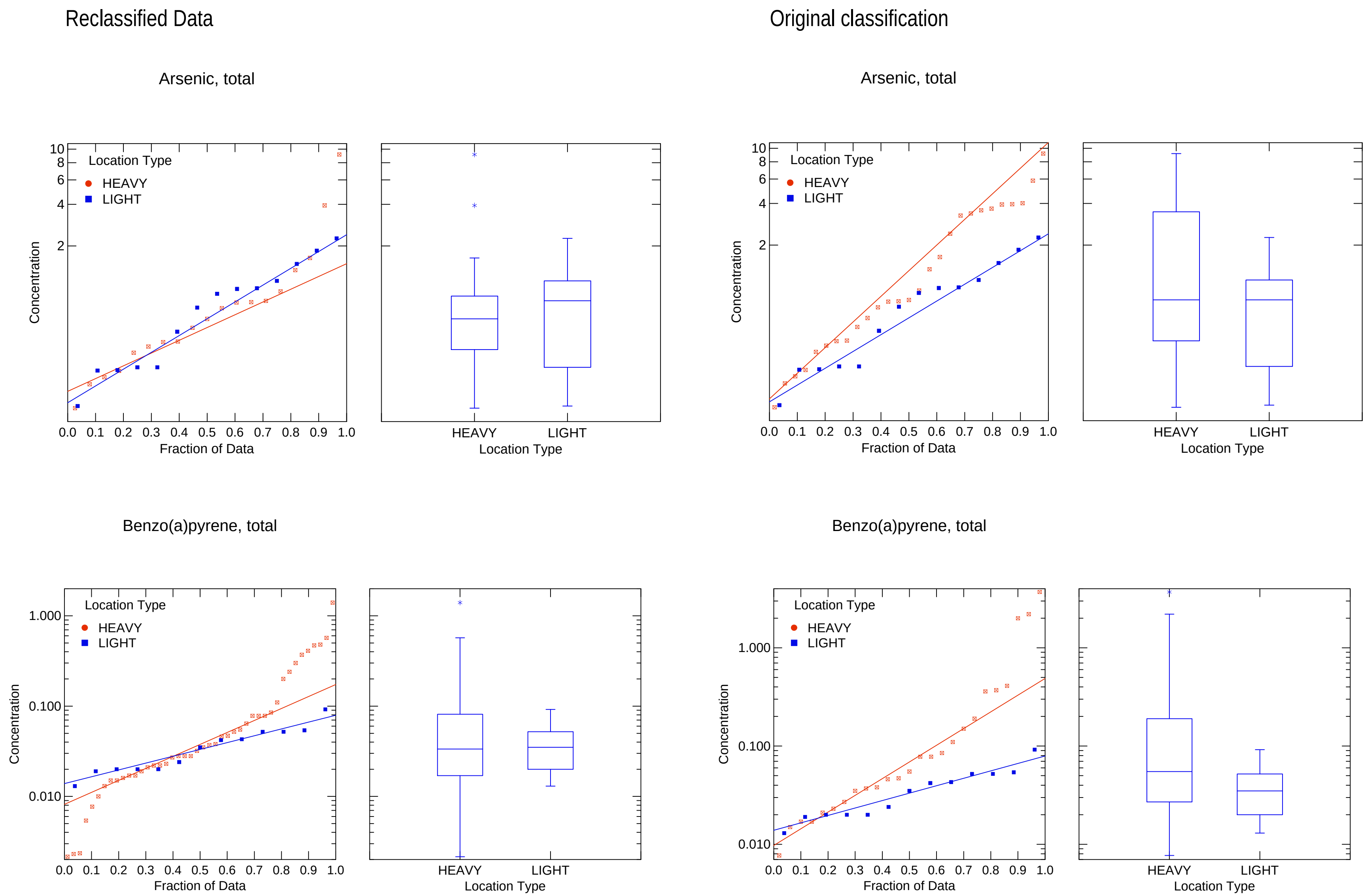
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 5-4
Example Graphical Evaluations of Unique and Representative Heavy Industrial Data Distributions
Stormwater Loading Calculations Methods

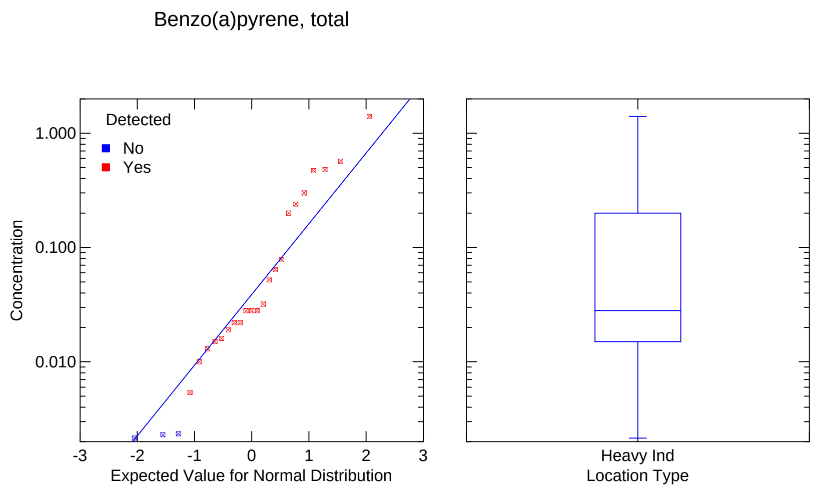


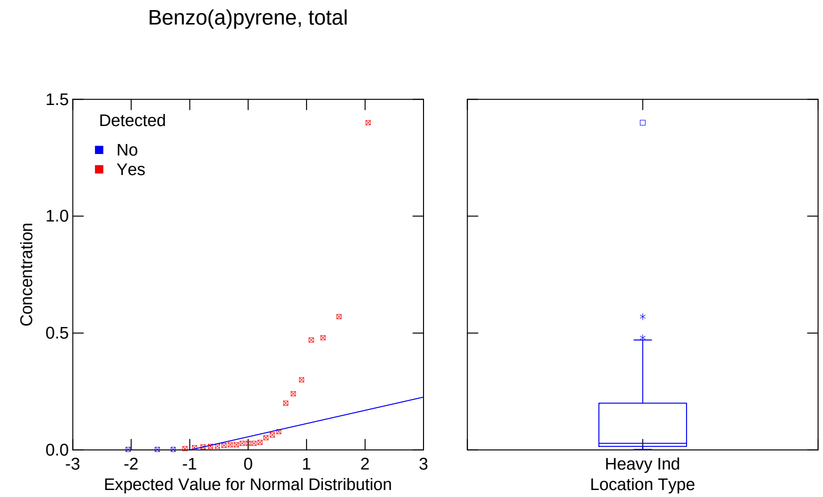
DO NOT QUOTE OR CITE
This document is currently under review by US EPA and its federal, state and tribal partners and is subject to change in whole or in part.

ANCHOR ENVIRONMENTAL, L.L.C.

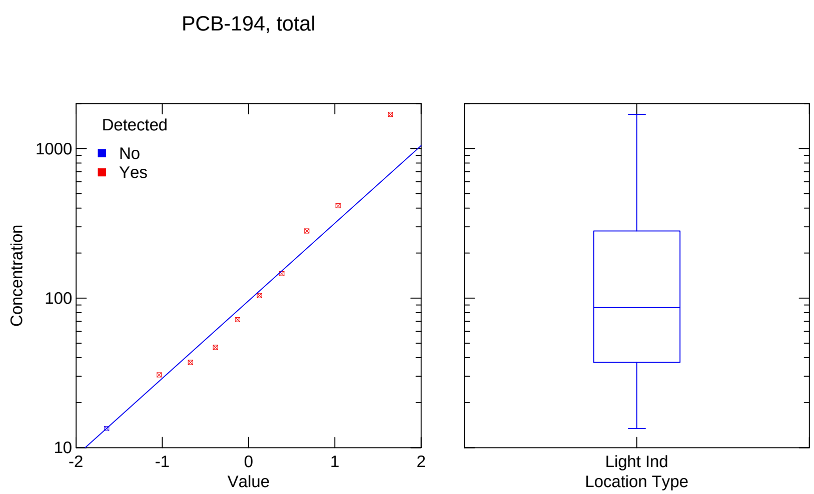
Figure 5-5
Example Graphical Evaluations of Representative Heavy Industrial and Light Industrial Data Distributions
Stormwater Loading Calculations Methods

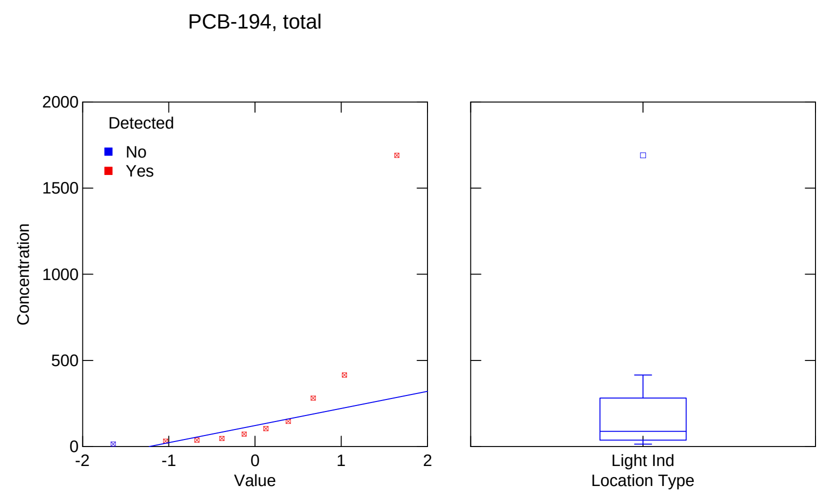
Unique Location Type, Heavy Industrial Land Use Classification, Original Data Classification





Representative Location Type, Light Industrial Land Use Classification, Original Data Classification





DO NOT QUOTE OR CITE
This document is currently under review by US EPA and its federal, state and tribal partners and is subject to change in whole or in part.

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 5-6
Example Graphical Evaluations of Outlier Analysis
Stormwater Loading Calculations Methods

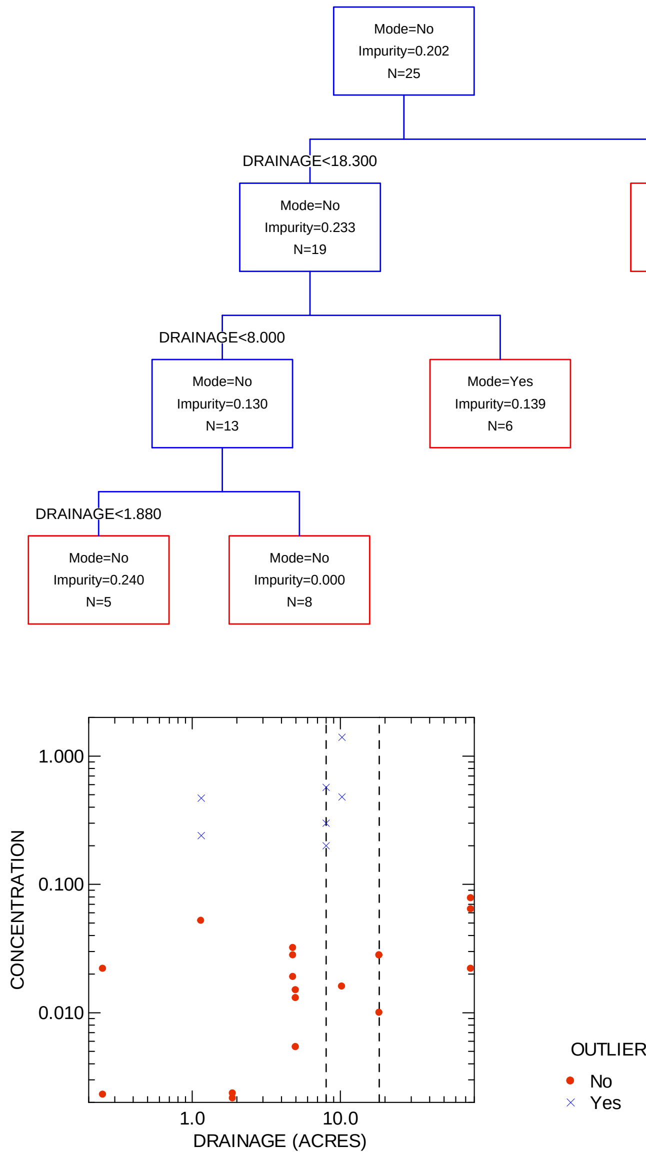
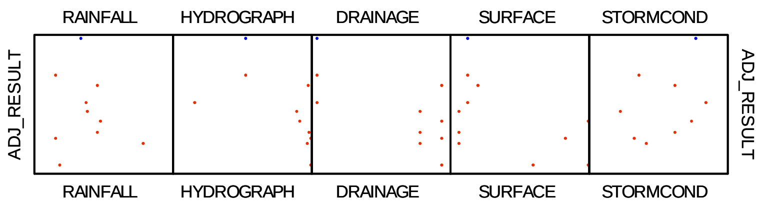


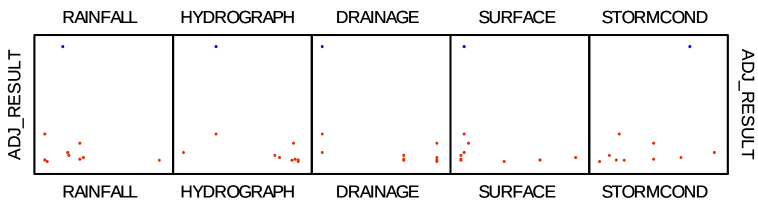
Figure 5-7
Example Classification Tree Analysis for Total Benzo(a)pyrene, Unique Heavy Industrial (Original Classification)
Stormwater Loading Calculations Methods

PCB-194, TOTAL

LOG-LOG SCALE



NORMAL SCALE



OUTLIER

- No
- Yes

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 5-8
Scatterplot Matrix of Total PCB-194, Representative Light Industrial (Original Classification) Data Set with Stormwater Variables
Stormwater Loading Calculations Methods

Appendix A

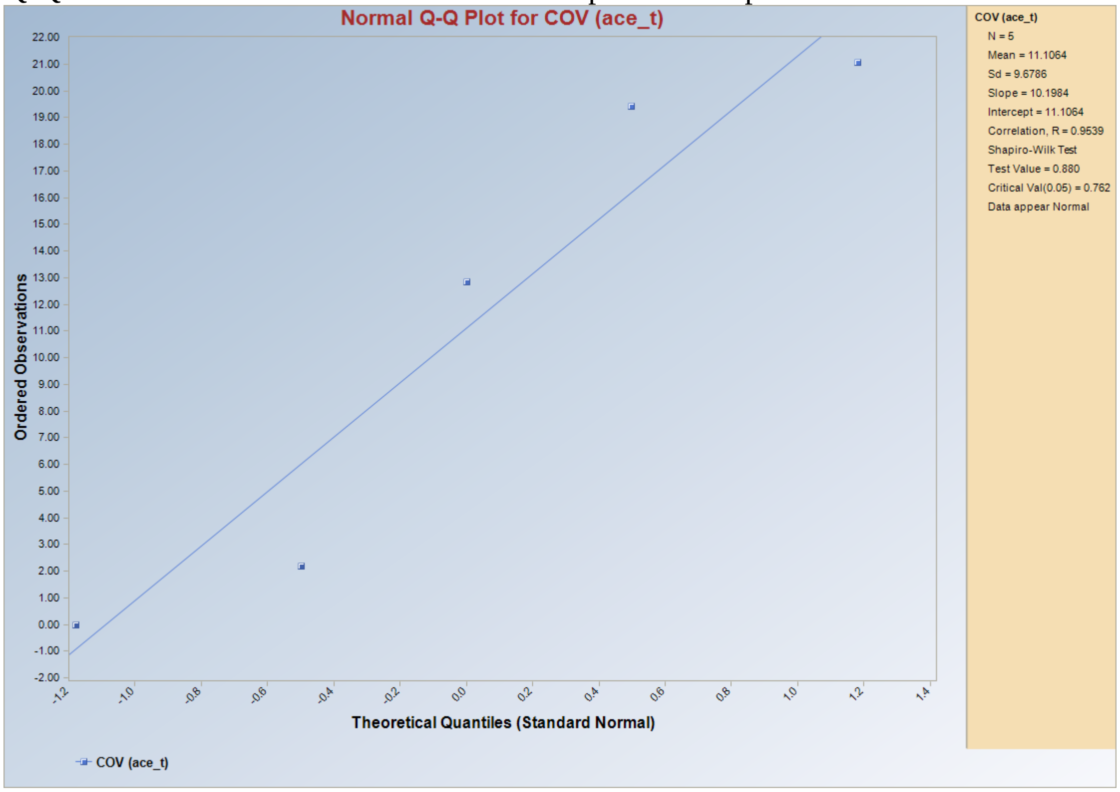
Preliminary Data Analysis Using First Round Stormwater Data

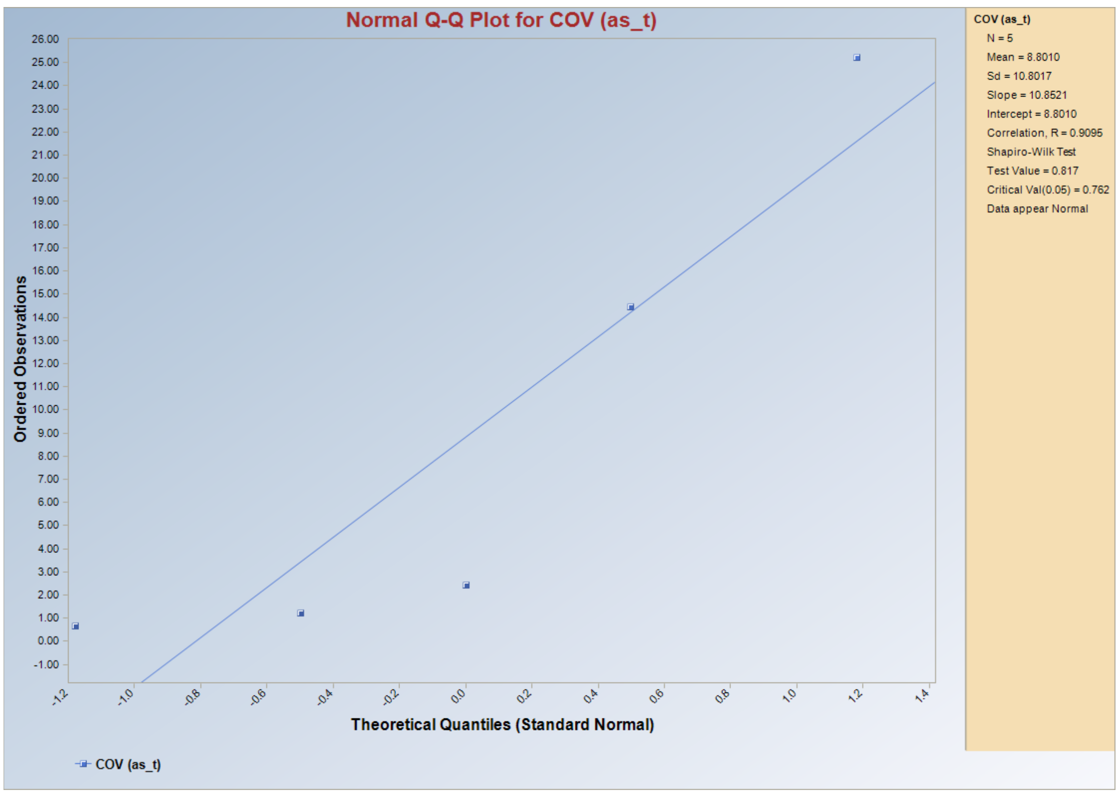
TABLE OF CONTENTS

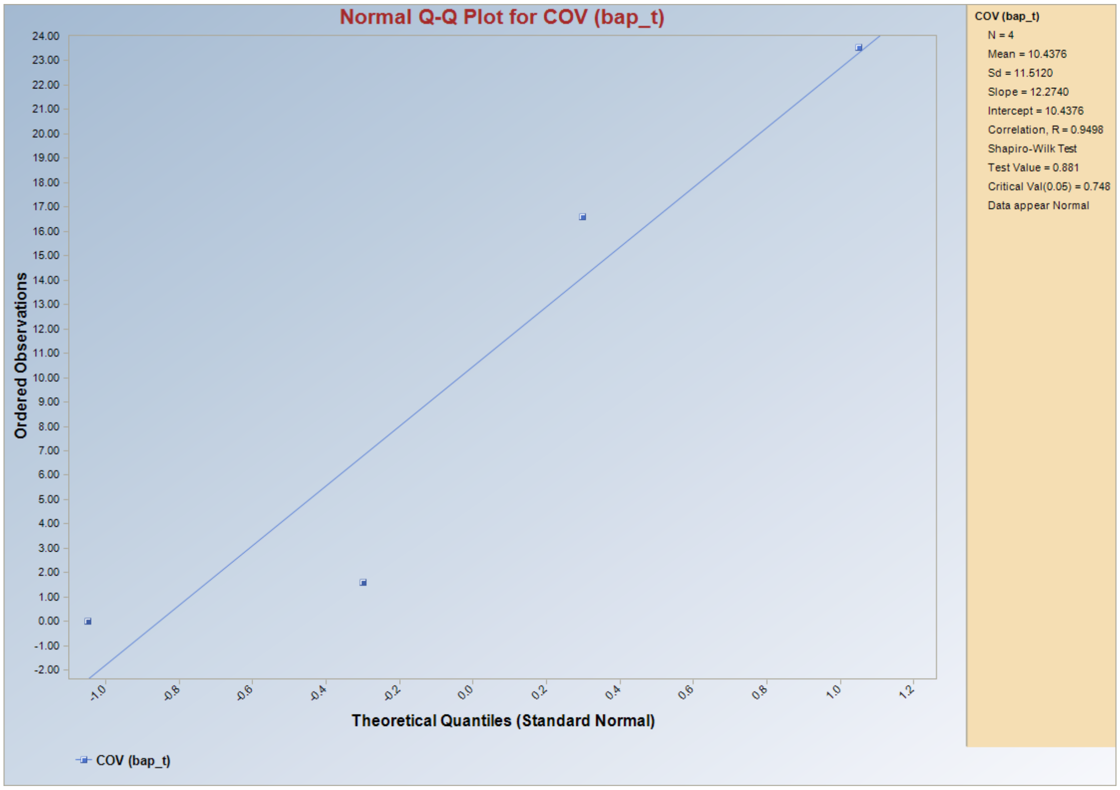
Appendix A-1

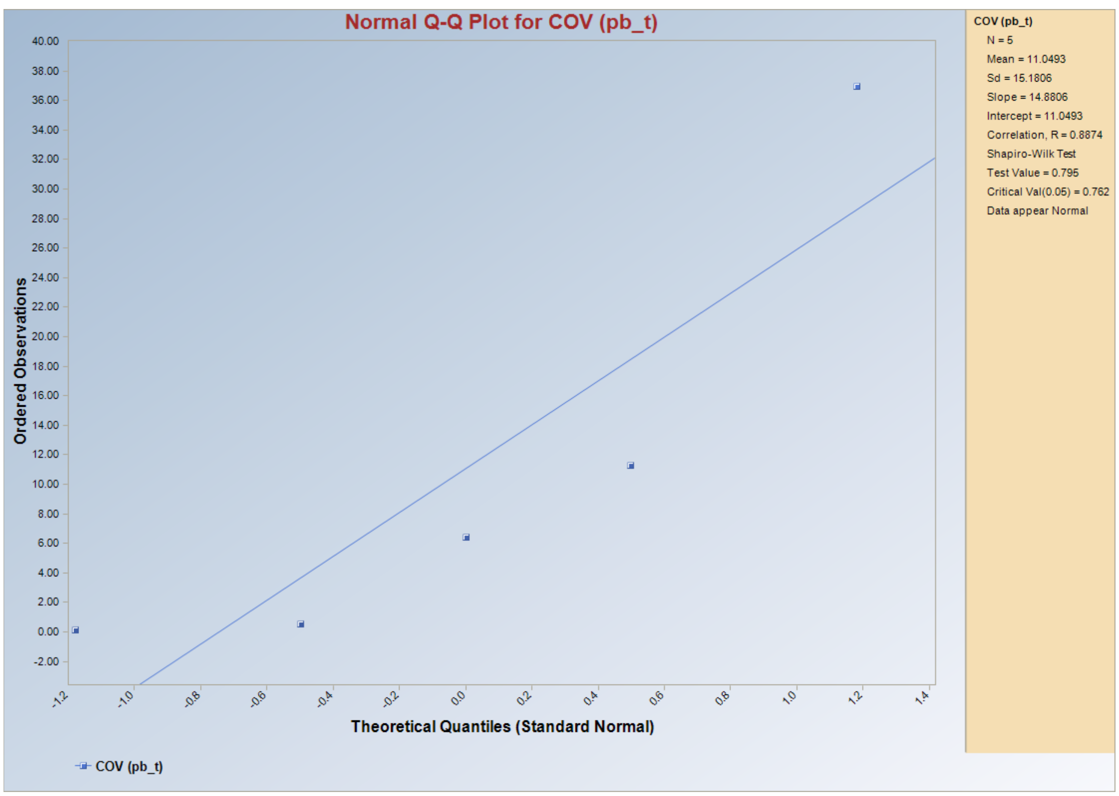
Duplicate Analysis Graphs

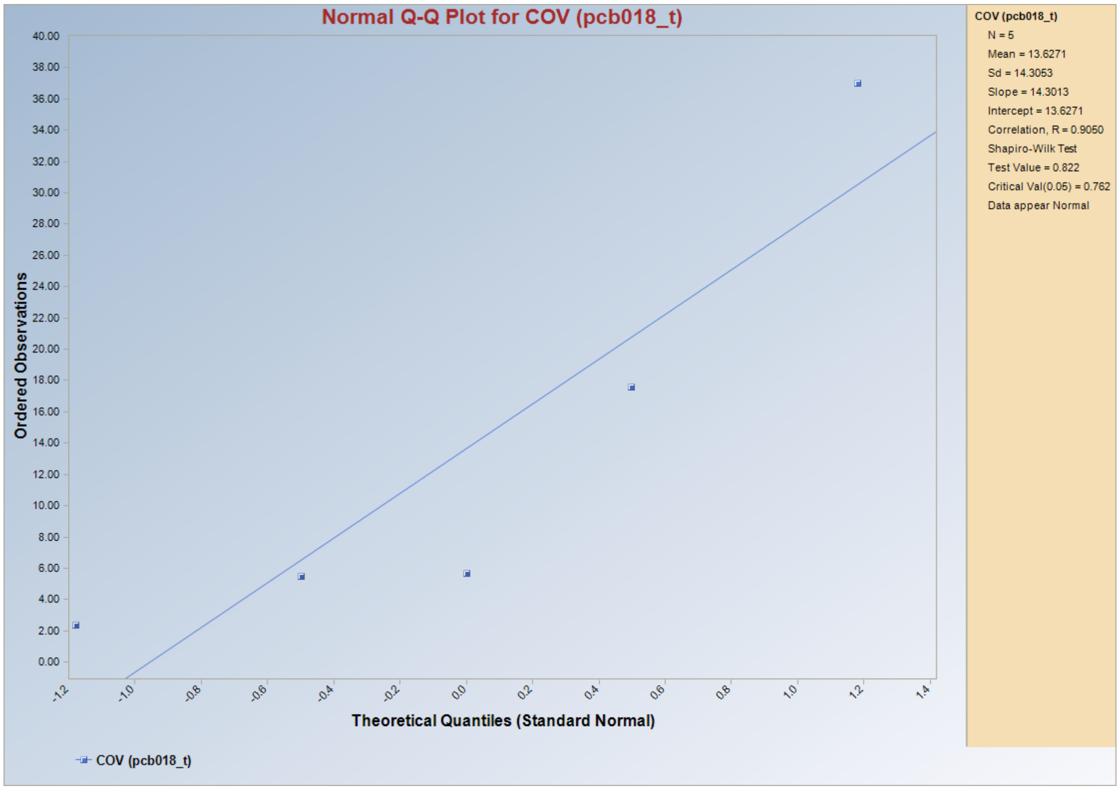
Q-Q Plots of Coefficient of Variation for samples with duplicate results

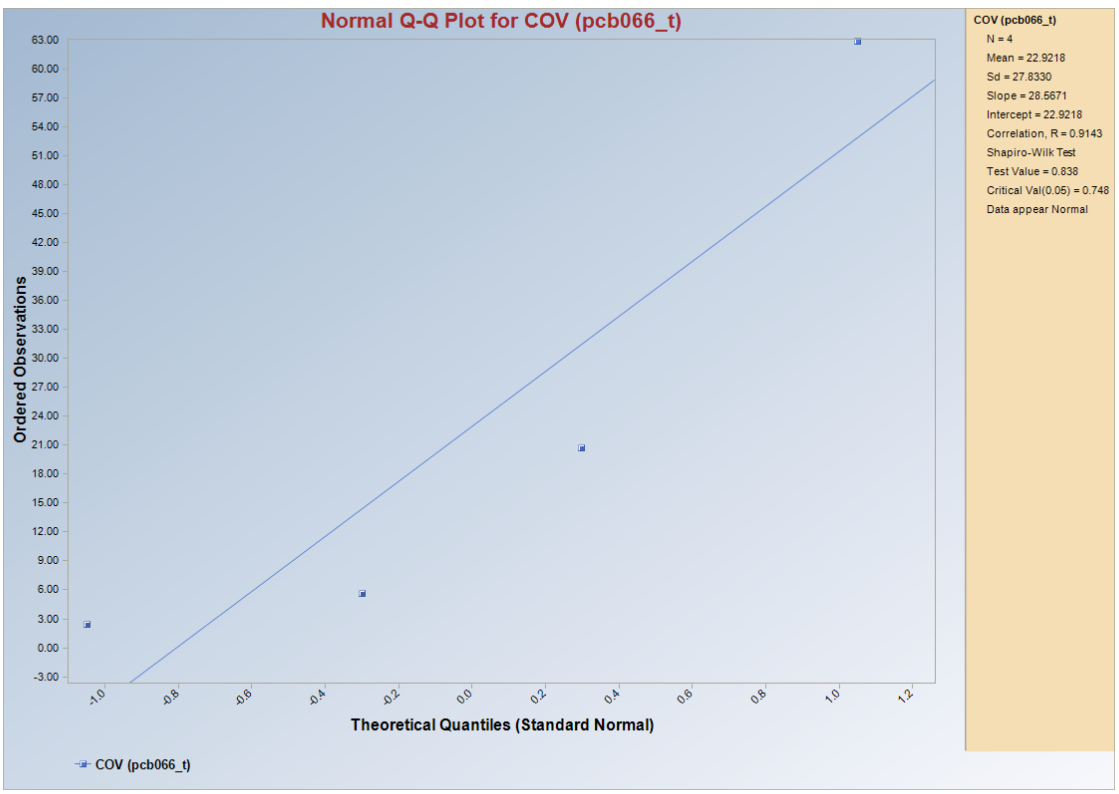


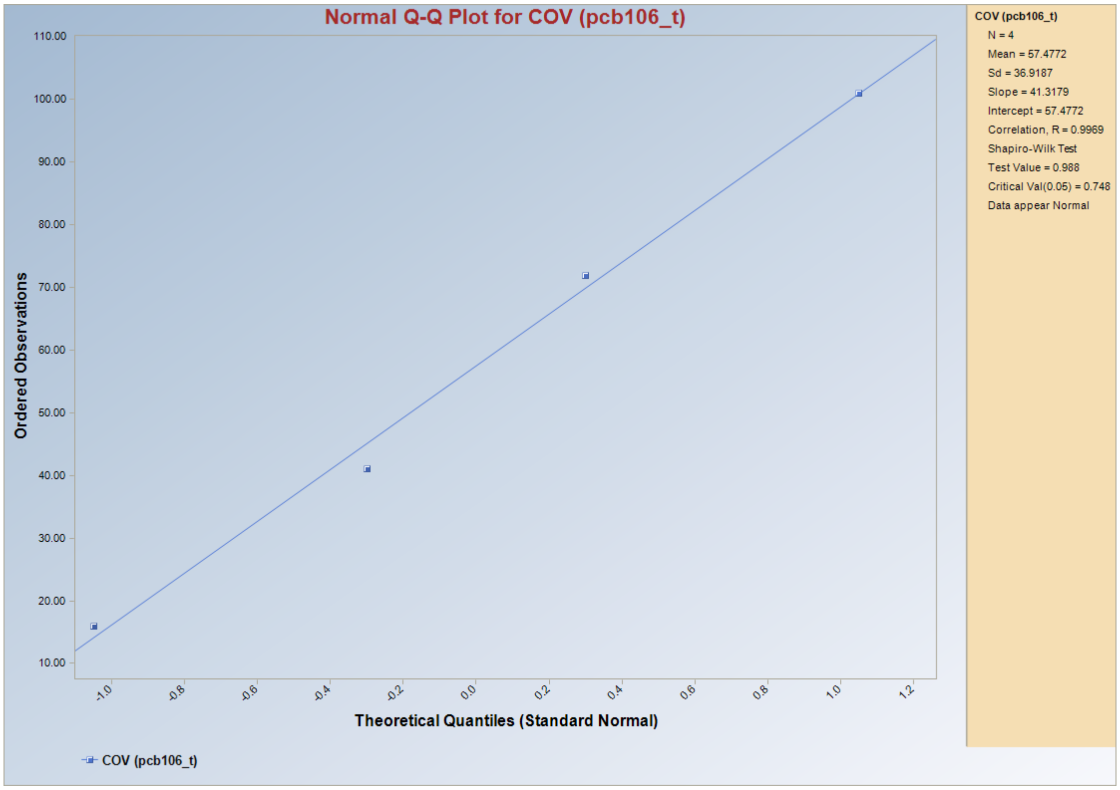


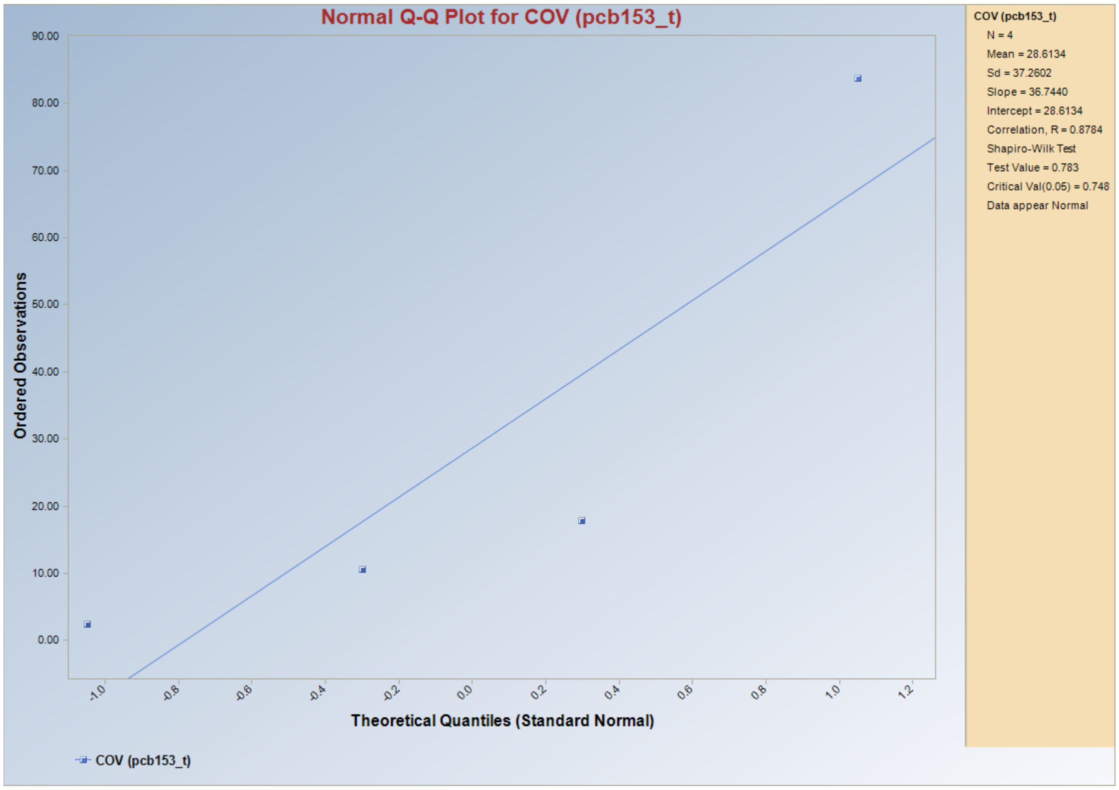

Normal Q-Q Plot for COV (bap_t)
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (bap_t)
COV (bap_t)
N = 4
Mean = 10.4376
Sd = 11.5120
Slope = 12.2740
Intercept = 10.4376
Correlation, R = 0.9498
Shapiro-Wilk Test
Test Value = 0.881
Critical Val(0.05) = 0.748
Data appear Normal

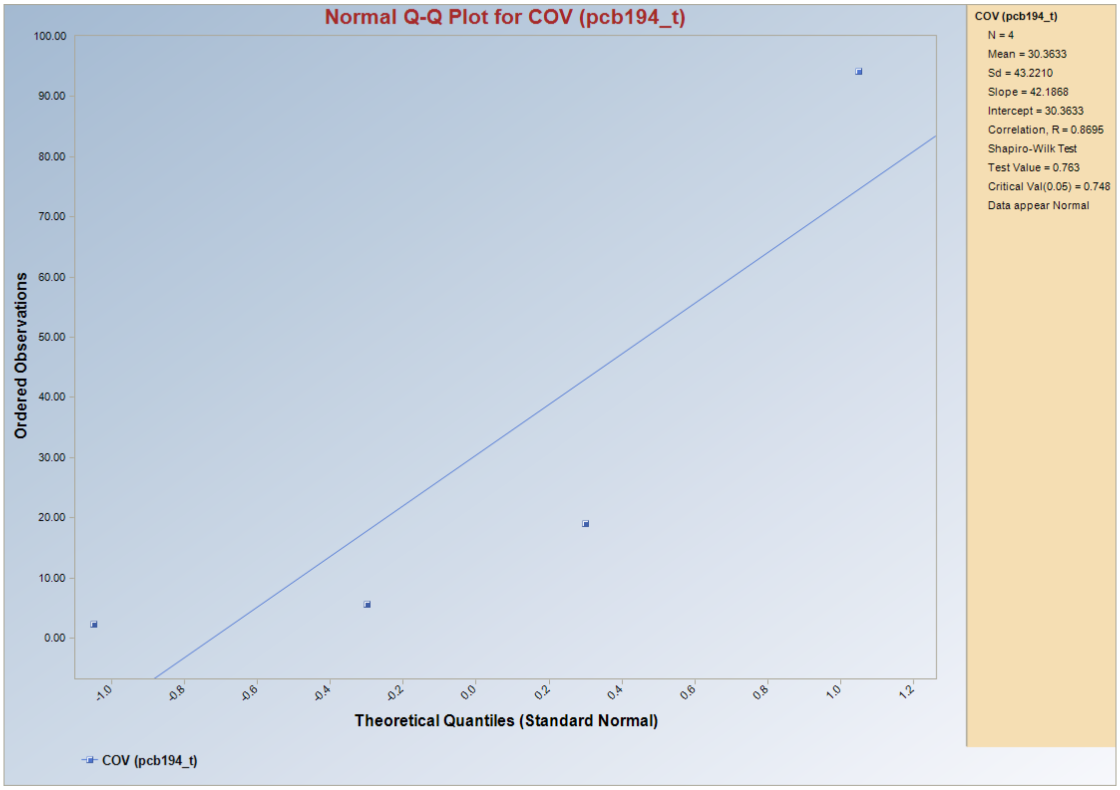

Normal Q-Q Plot for COV (pb_t)
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (pb_t)
COV (pb_t)
N = 5
Mean = 11.0493
Sd = 15.1806
Slope = 14.8806
Intercept = 11.0493
Correlation, R = 0.8874
Shapiro-Wilk Test
Test Value = 0.795
Critical Val(0.05) = 0.762
Data appear Normal

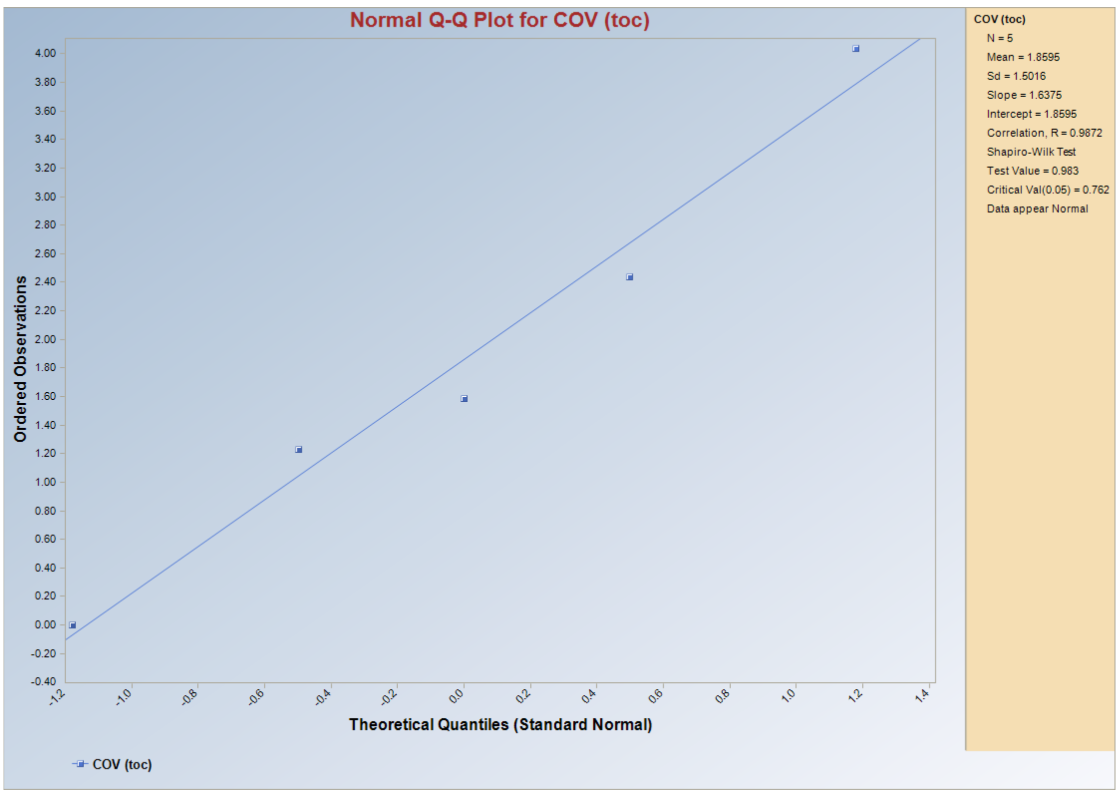

Normal Q-Q Plot for COV (pcb018_t)
COV (pcb018_t)
N = 5
Mean = 13.6271
Sd = 14.3053
Slope = 14.3013
Intercept = 13.6271
Correlation, R = 0.9050
Shapiro-Wilk Test
Test Value = 0.822
Critical Val(0.05) = 0.762
Data appear Normal
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (pcb018_t)

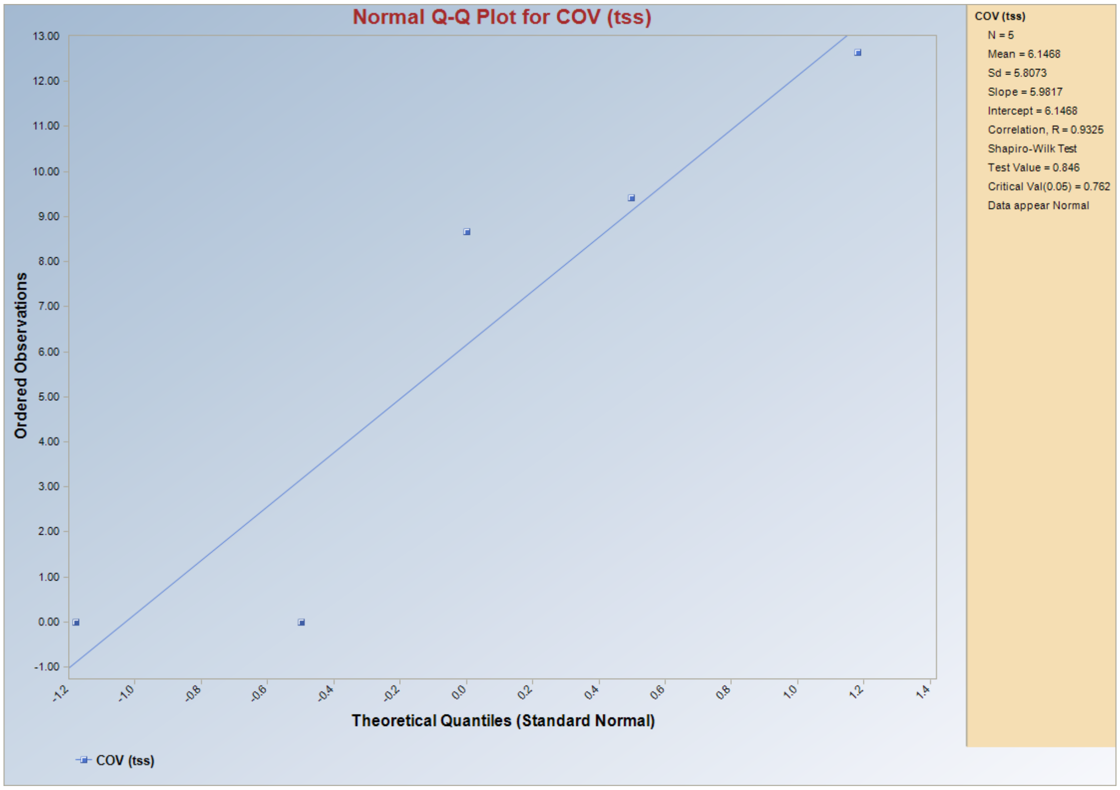

Normal Q-Q Plot for COV (pcb066_t)
COV (pcb066_t)
N = 4
Mean = 22.9218
Sd = 27.8330
Slope = 28.5671
Intercept = 22.9218
Correlation, R = 0.9143
Shapiro-Wilk Test
Test Value = 0.838
Critical Val(0.05) = 0.748
Data appear Normal
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (pcb066_t)


Normal Q-Q Plot for COV (pcb106_t)
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (pcb106_t)
COV (pcb106_t)
N = 4
Mean = 57.4772
Sd = 36.9187
Slope = 41.3179
Intercept = 57.4772
Correlation, R = 0.9969
Shapiro-Wilk Test
Test Value = 0.988
Critical Val(0.05) = 0.748
Data appear Normal

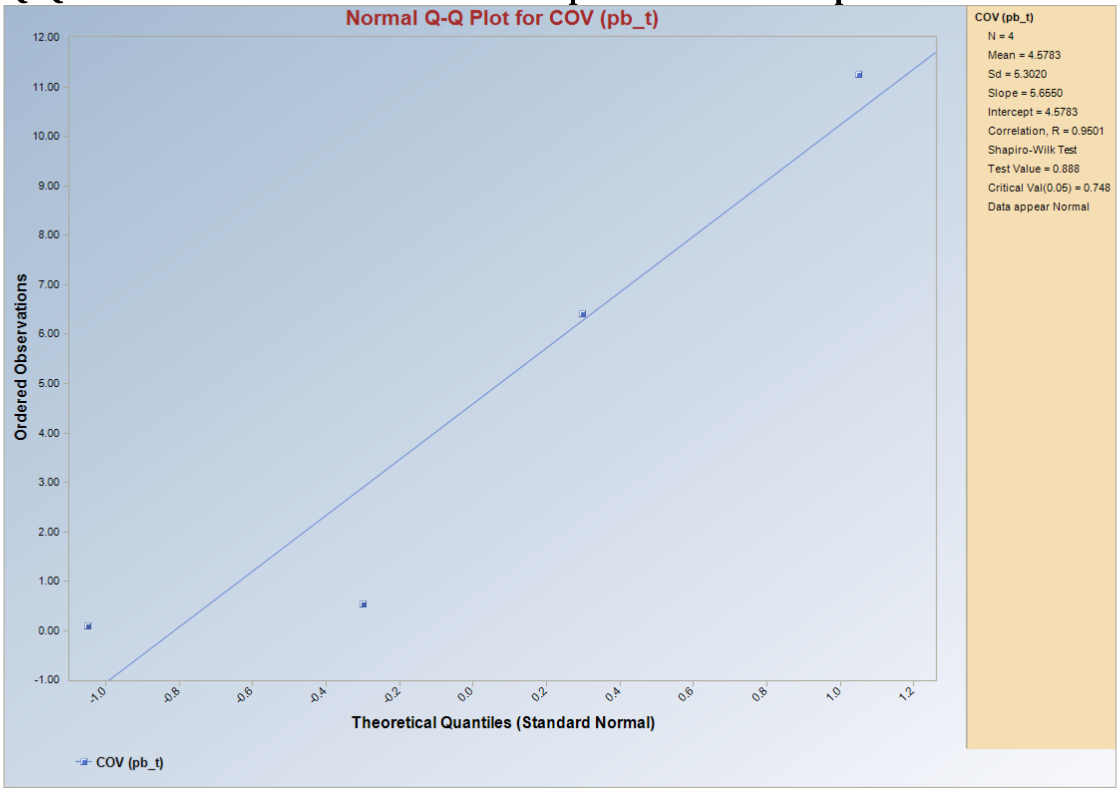

Normal Q-Q Plot for COV (pcb153_t)
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (pcb153_t)
COV (pcb153_t)
N = 4
Mean = 28.6134
Sd = 37.2602
Slope = 36.7440
Intercept = 28.6134
Correlation, R = 0.8784
Shapiro-Wilk Test
Test Value = 0.783
Critical Val(0.05) = 0.748
Data appear Normal

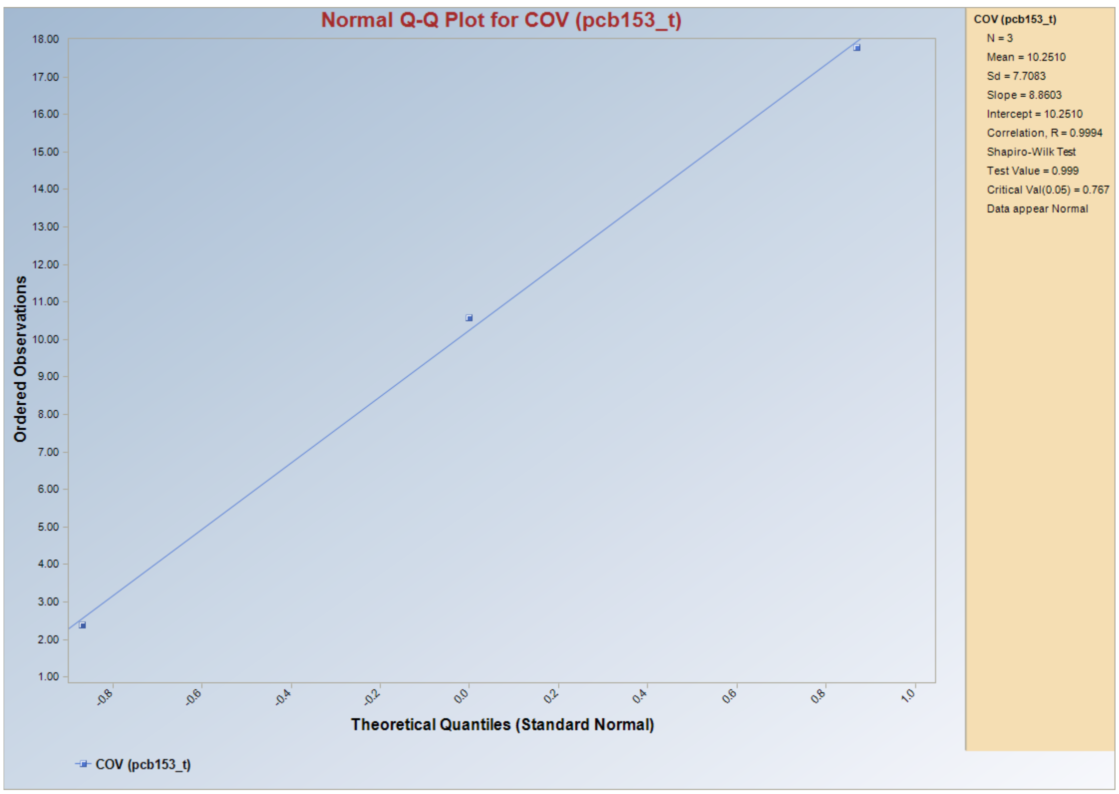

Normal Q-Q Plot for COV (pcb194_t)
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (pcb194_t)
COV (pcb194_t)
N = 4
Mean = 30.3633
Sd = 43.2210
Slope = 42.1868
Intercept = 30.3633
Correlation, R = 0.8695
Shapiro-Wilk Test
Test Value = 0.763
Critical Val(0.05) = 0.748
Data appear Normal

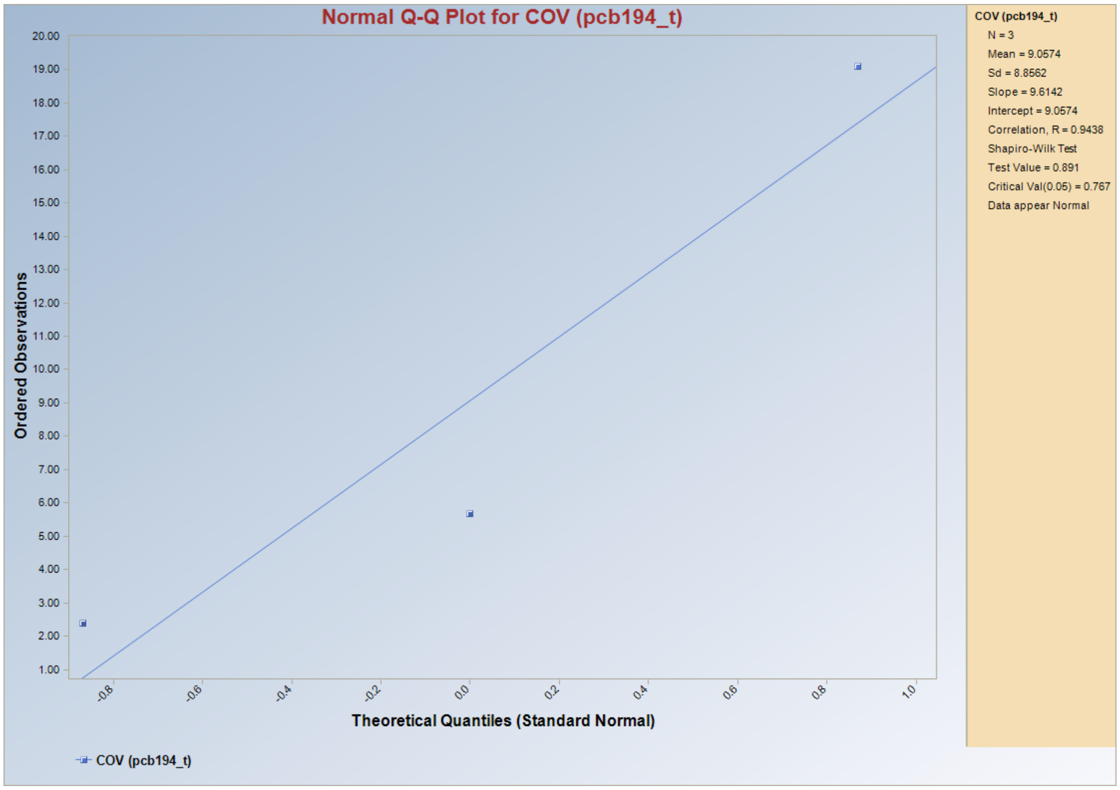

Normal Q-Q Plot for COV (toc)
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (toc)
COV (toc)
N = 5
Mean = 1.8595
Sd = 1.5016
Slope = 1.6375
Intercept = 1.8595
Correlation, R = 0.9872
Shapiro-Wilk Test
Test Value = 0.983
Critical Val(0.05) = 0.762
Data appear Normal


Normal Q-Q Plot for COV (tss)
Ordered Observations
Theoretical Quantiles (Standard Normal)
COV (tss)
COV (tss)
N = 5
Mean = 6.1468
Sd = 5.8073
Slope = 5.9817
Intercept = 6.1468
Correlation, R = 0.9325
Shapiro-Wilk Test
Test Value = 0.846
Critical Val(0.05) = 0.762
Data appear Normal

Q-Q Plots of coefficient of variation of duplicate results with potential outliers removed





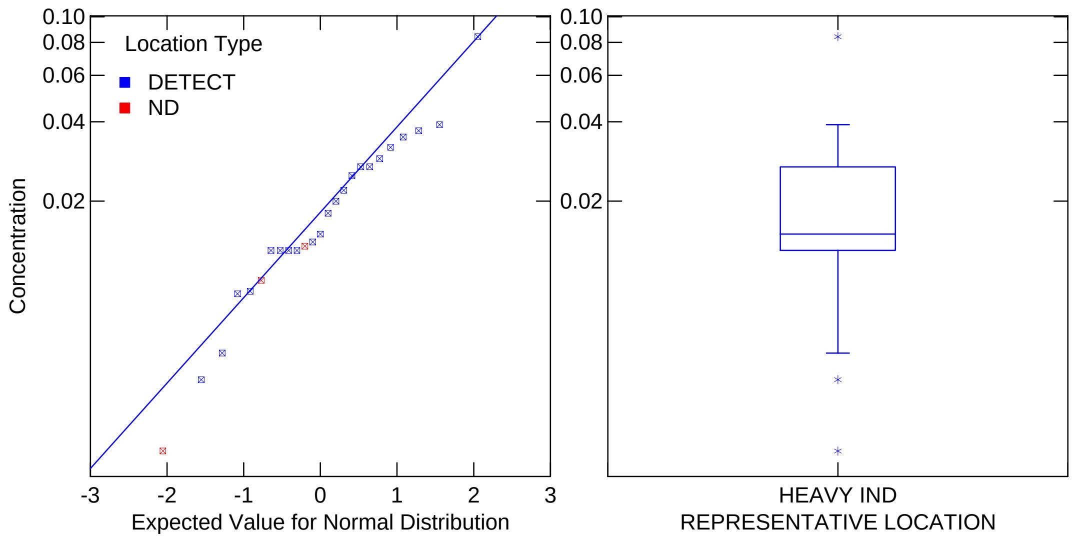

Normal Q-Q Plot for COV (pcb194_t)
Ordered Observations
Theoretical Quantiles (Standard Normal)
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
-0.8
-0.6
-0.4
-0.2
0.0
0.2
0.4
0.6
0.8
1.0
COV (pcb194_t)
COV (pcb194_t)
N = 3
Mean = 9.0574
Sd = 8.8562
Slope = 9.6142
Intercept = 9.0574
Correlation, R = 0.9438
Shapiro-Wilk Test
Test Value = 0.891
Critical Val(0.05) = 0.767
Data appear Normal

Appendix A-2

Outlier Analysis of Representative Heavy Industrial Locations

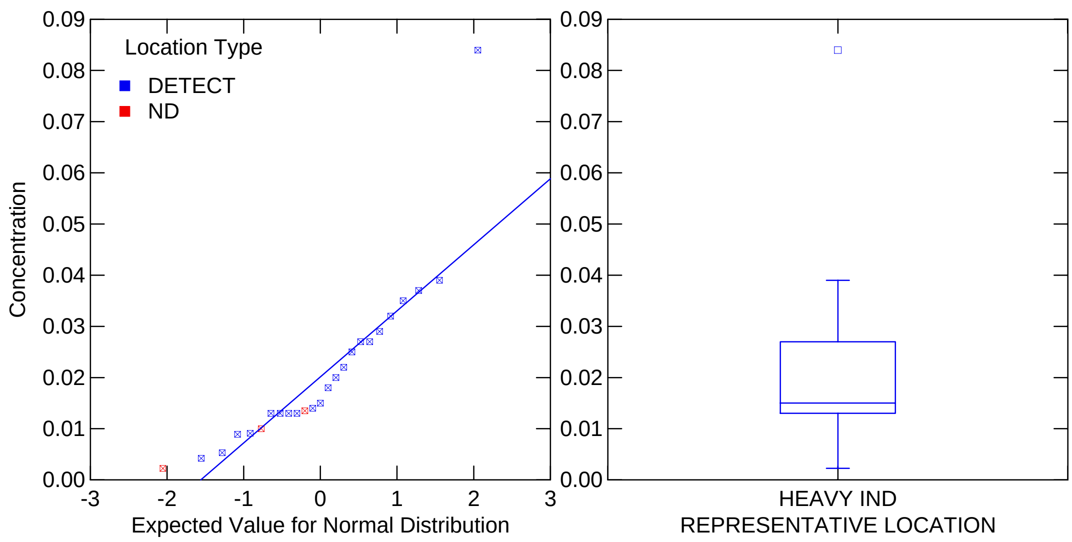
ACENAPHTHYLENE, TOTAL

ACENAPHTHYLENE, TOTAL

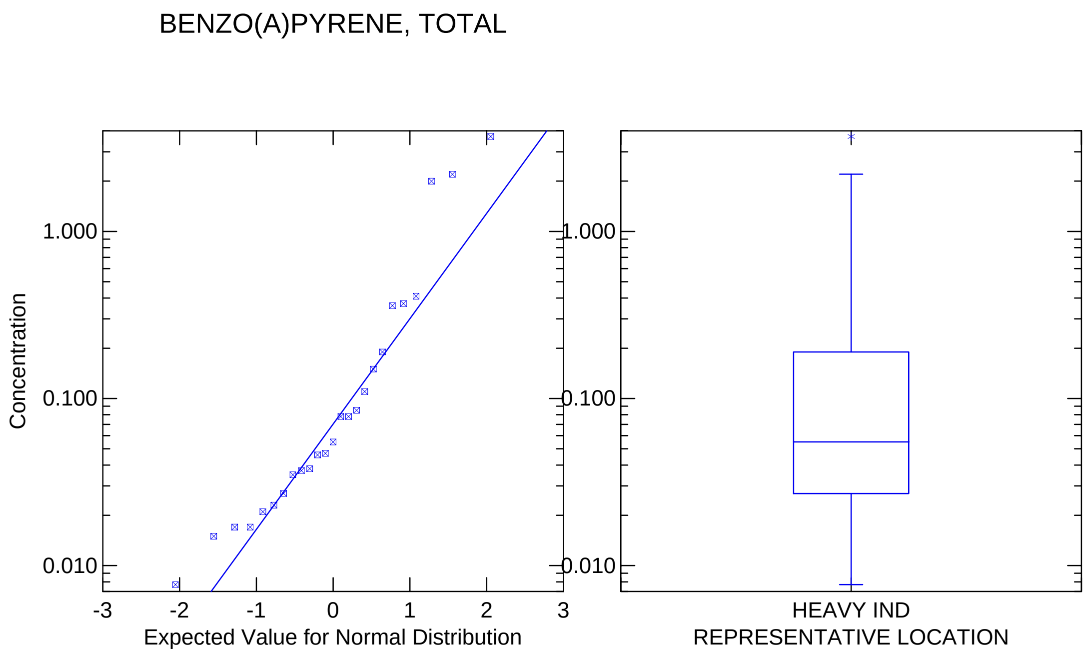


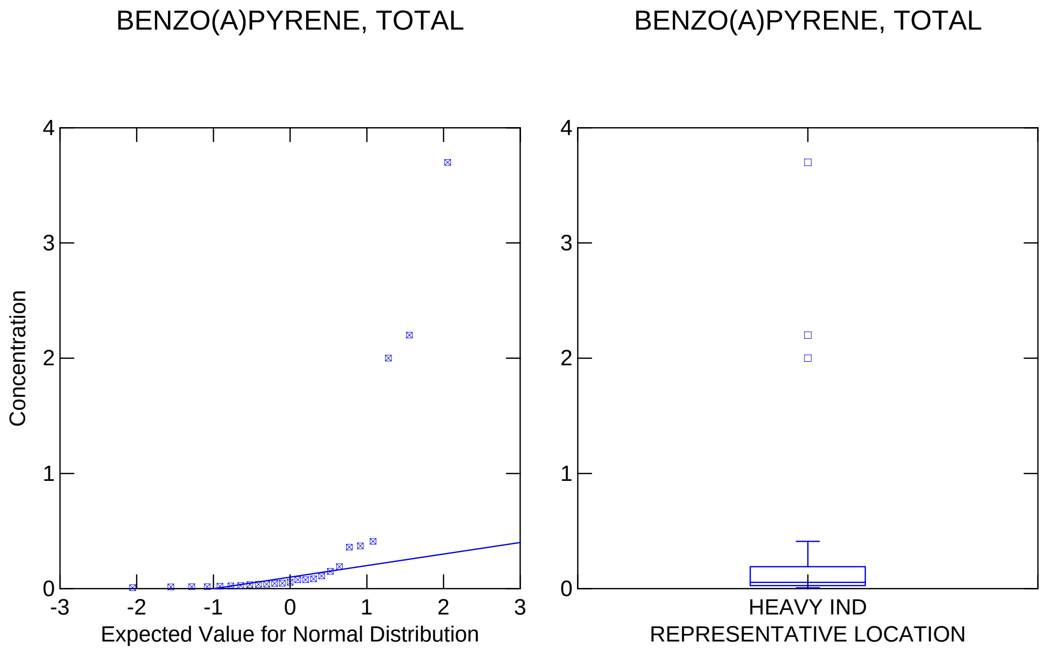
ACENAPHTHYLENE, TOTAL

ACENAPHTHYLENE, TOTAL



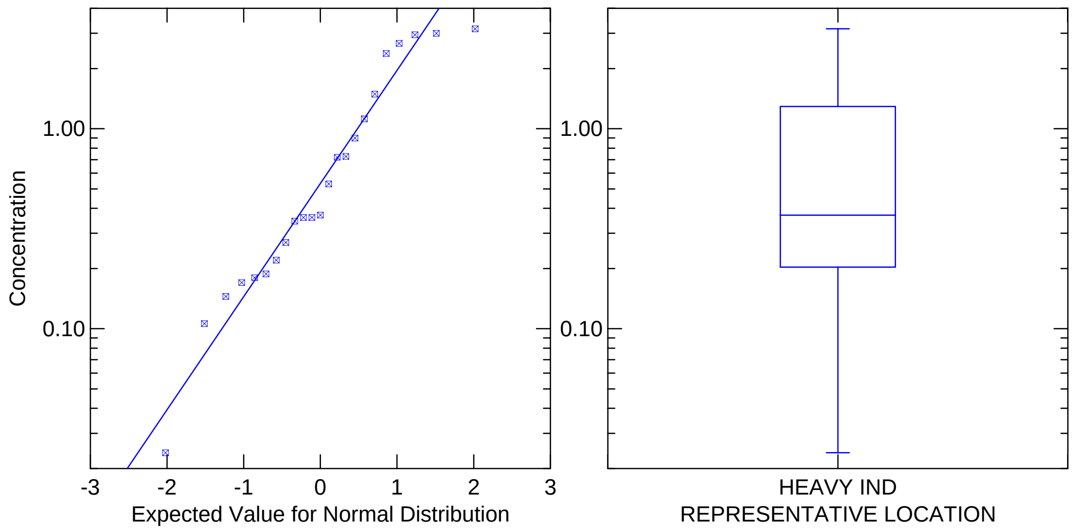
BENZO(A)PYRENE, TOTAL



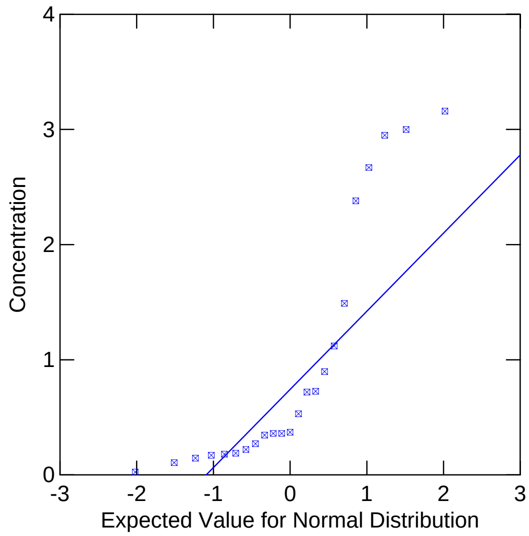


ARSENIC, DISSOLVED

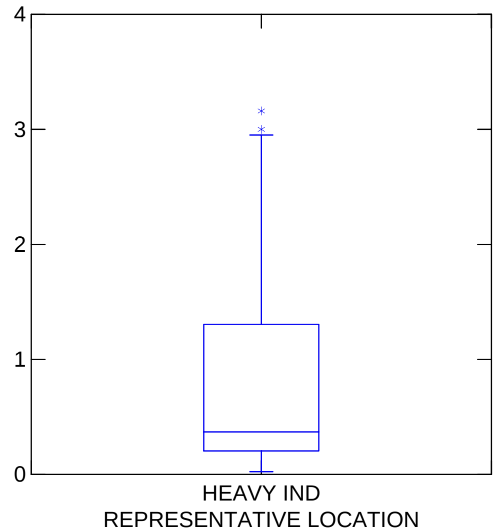
ARSENIC, DISSOLVED



ARSENIC, DISSOLVED

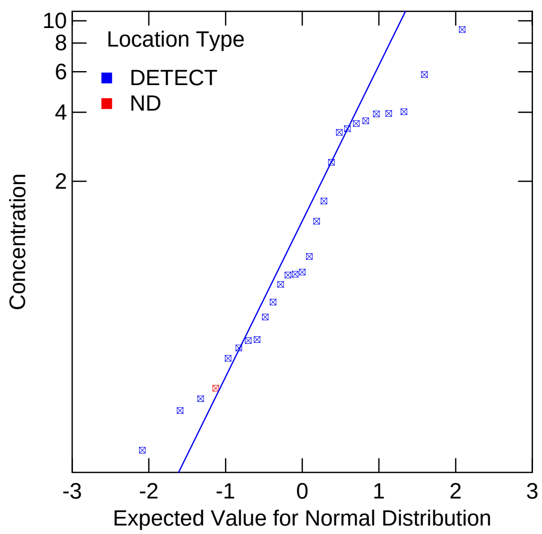


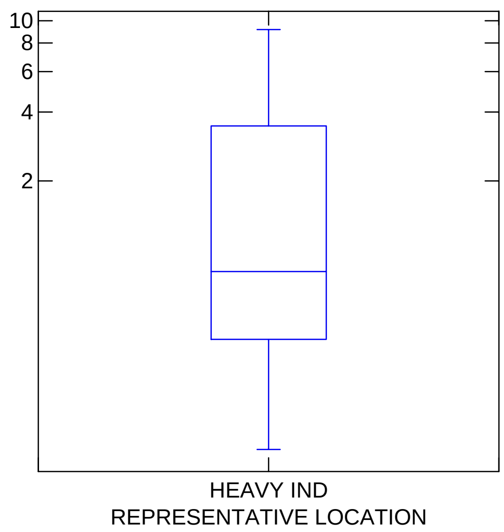
ARSENIC, DISSOLVED



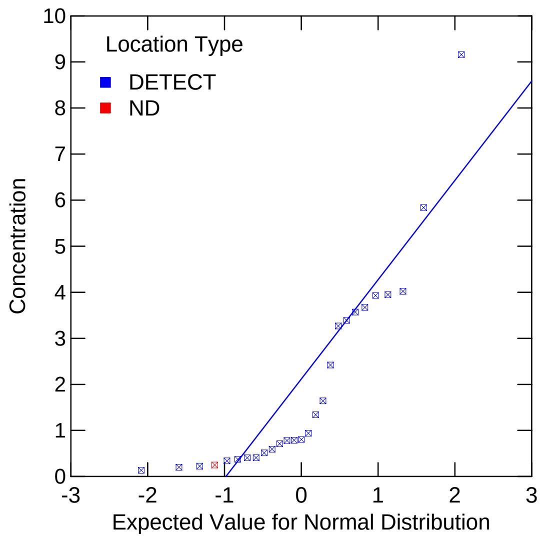
ARSENIC, TOTAL

ARSENIC, TOTAL

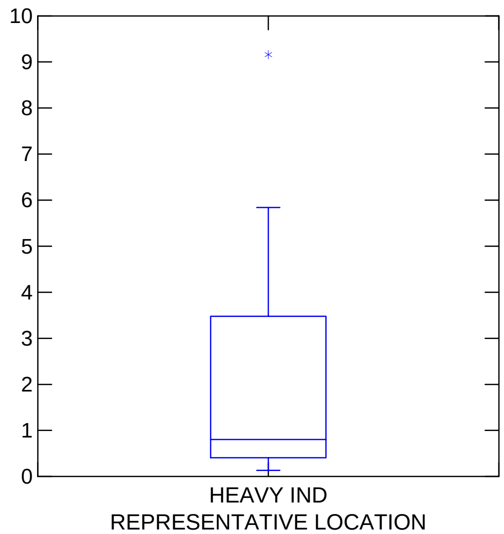




ARSENIC, TOTAL

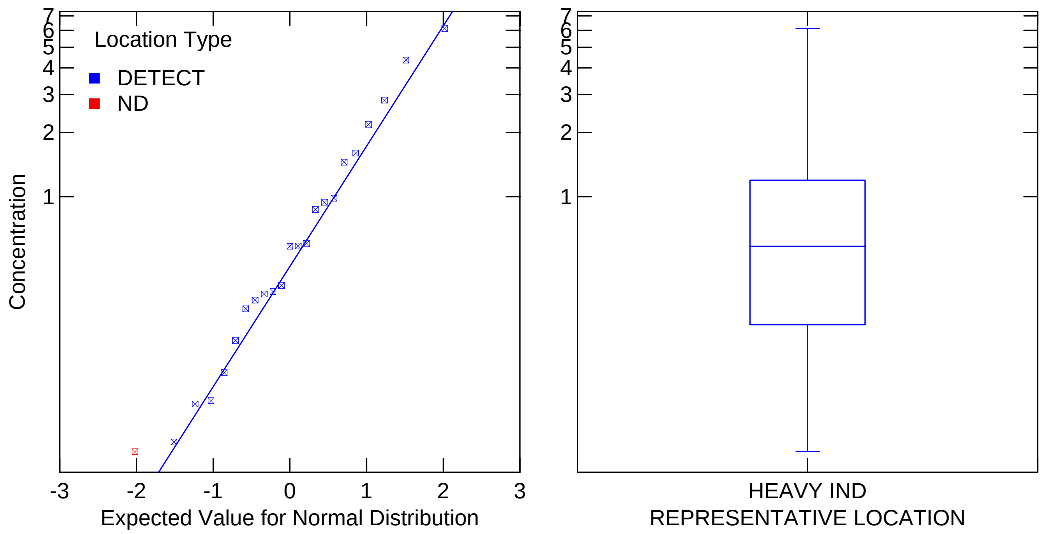


ARSENIC, TOTAL



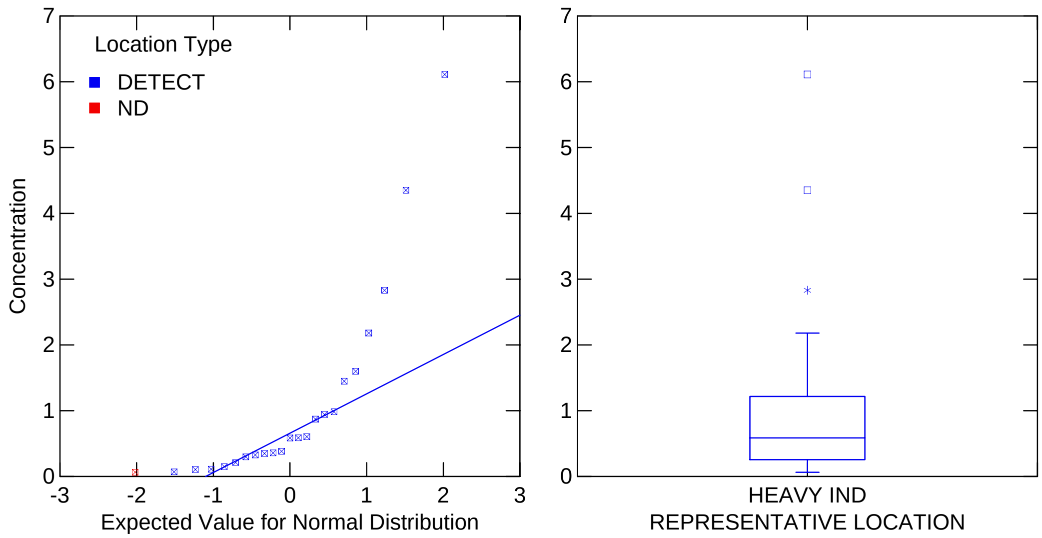
LEAD, DISSOLVED

LEAD, DISSOLVED



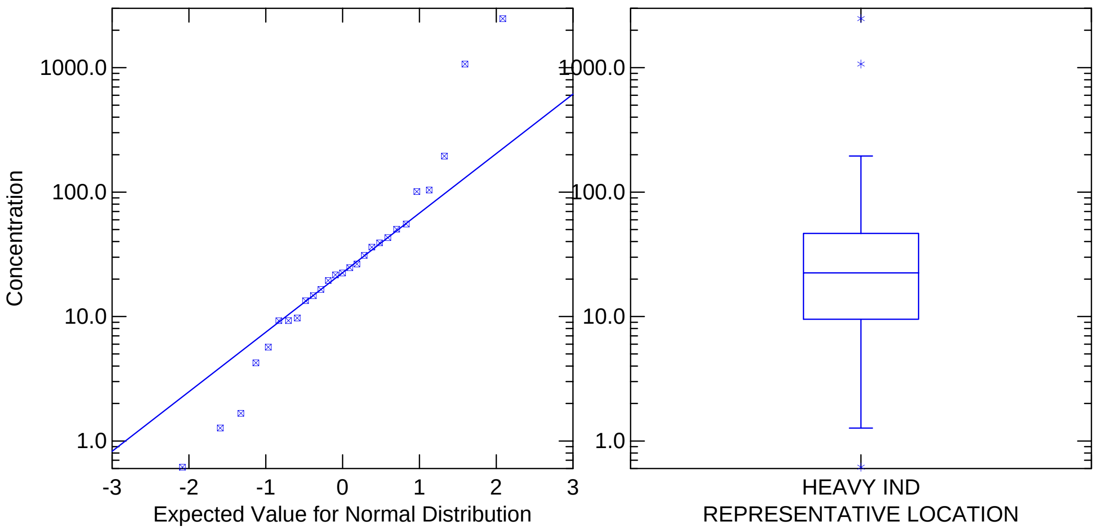
LEAD, DISSOLVED

LEAD, DISSOLVED



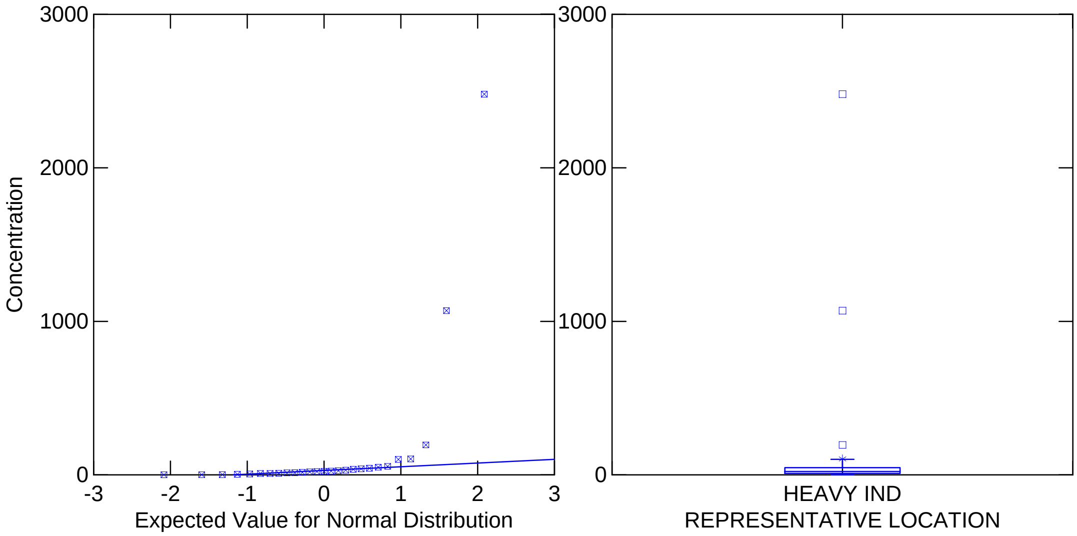
LEAD, TOTAL

LEAD, TOTAL



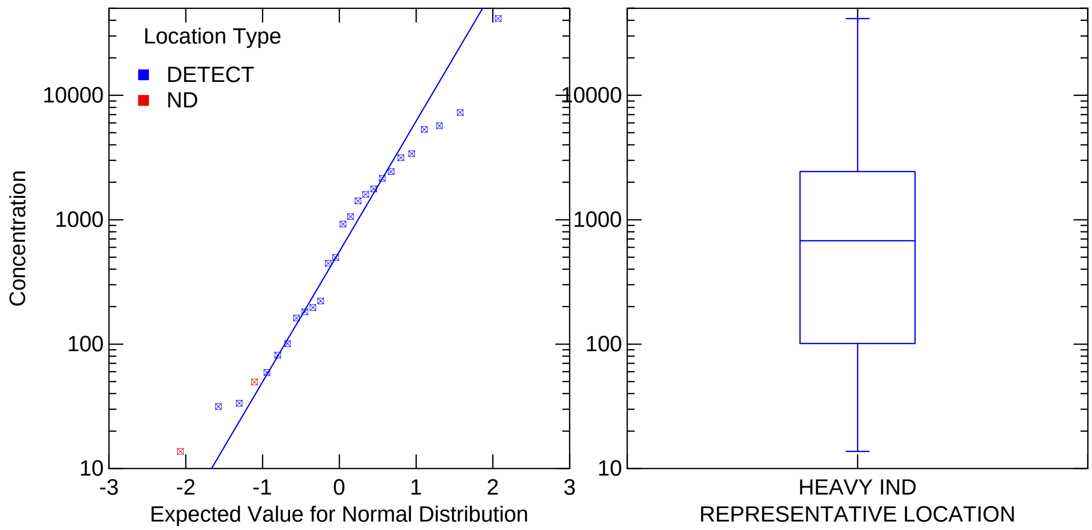
LEAD, TOTAL

LEAD, TOTAL



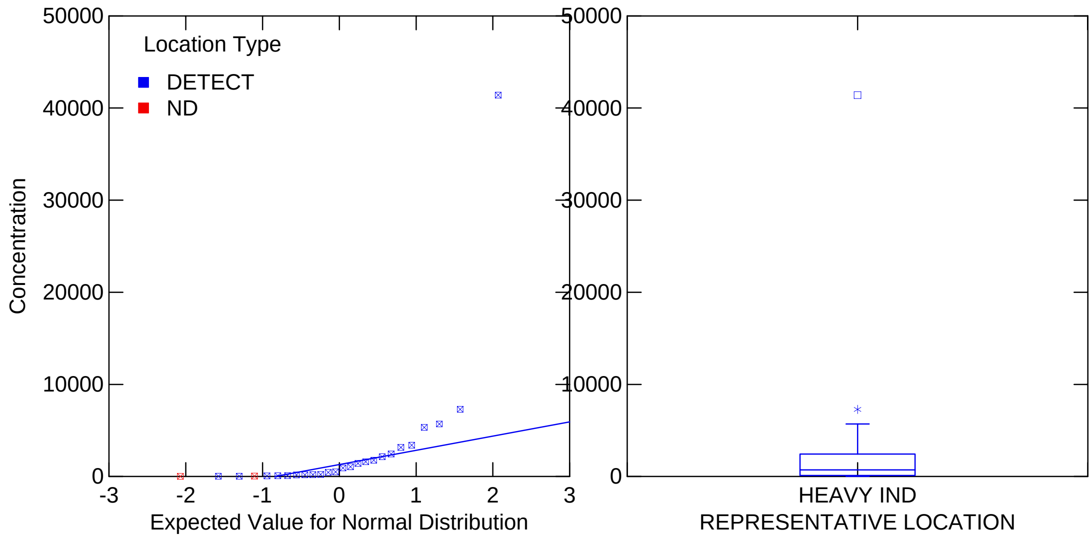
PCB-018, TOTAL

PCB-018, TOTAL

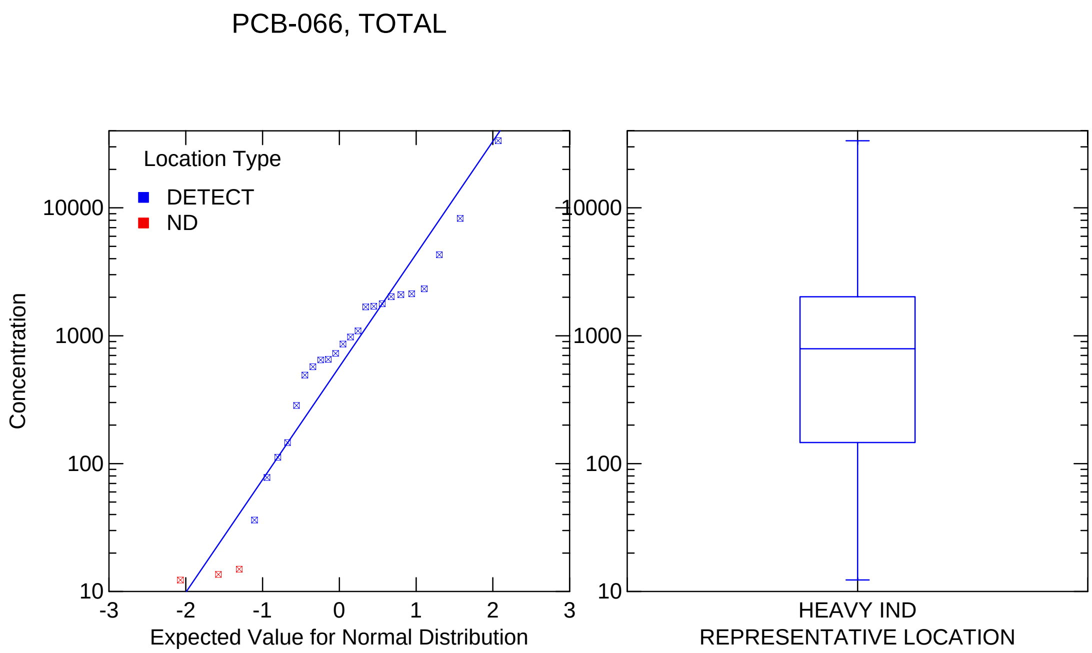


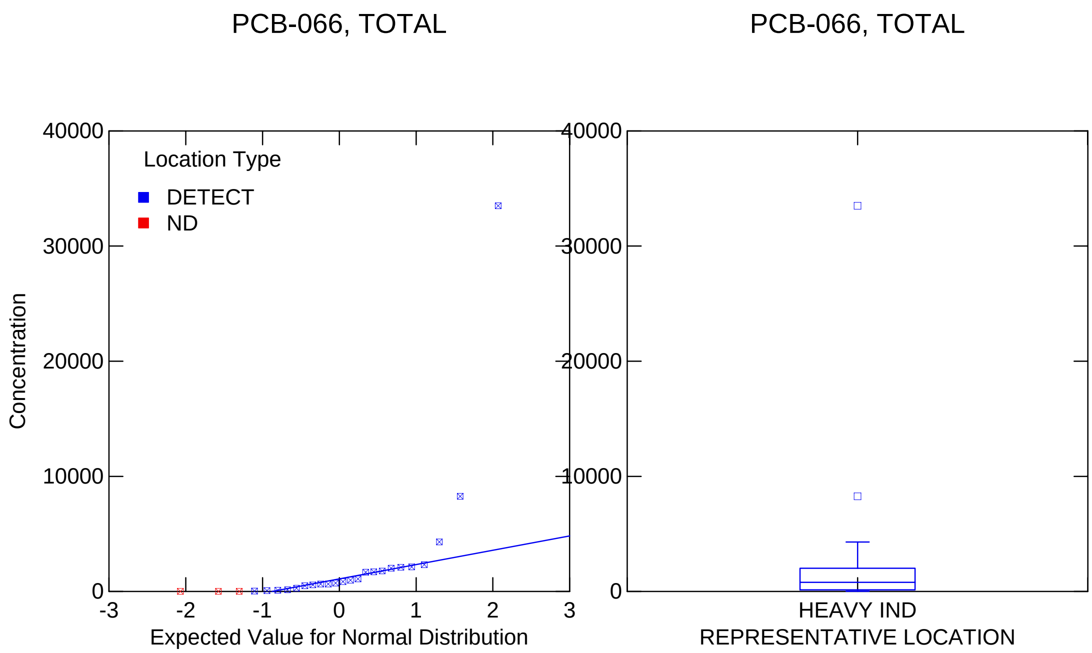
PCB-018, TOTAL

PCB-018, TOTAL

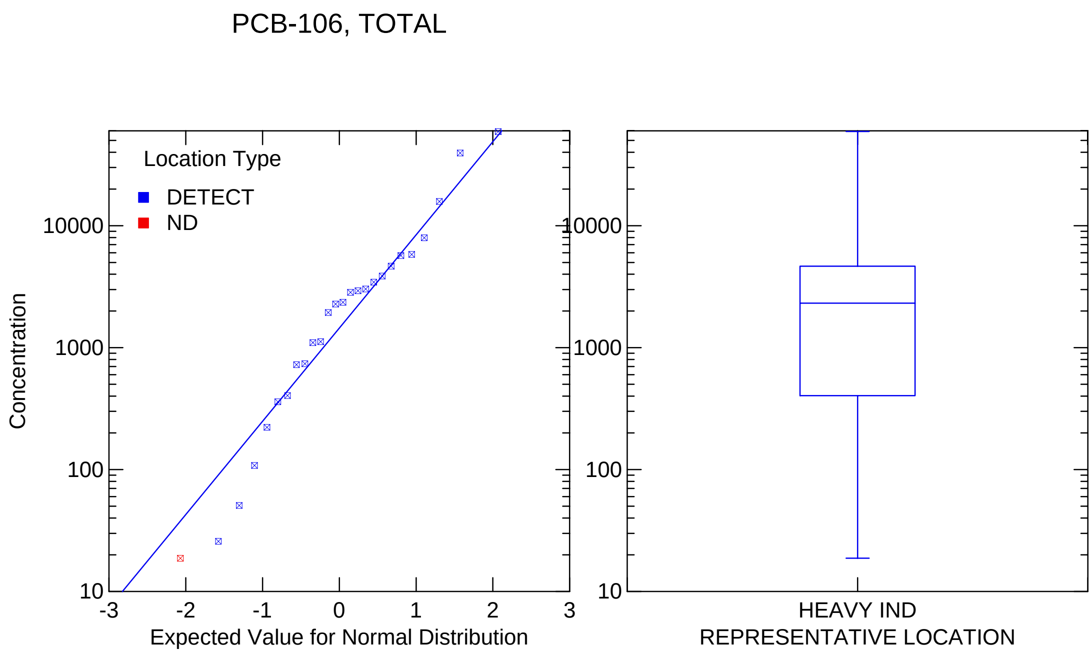


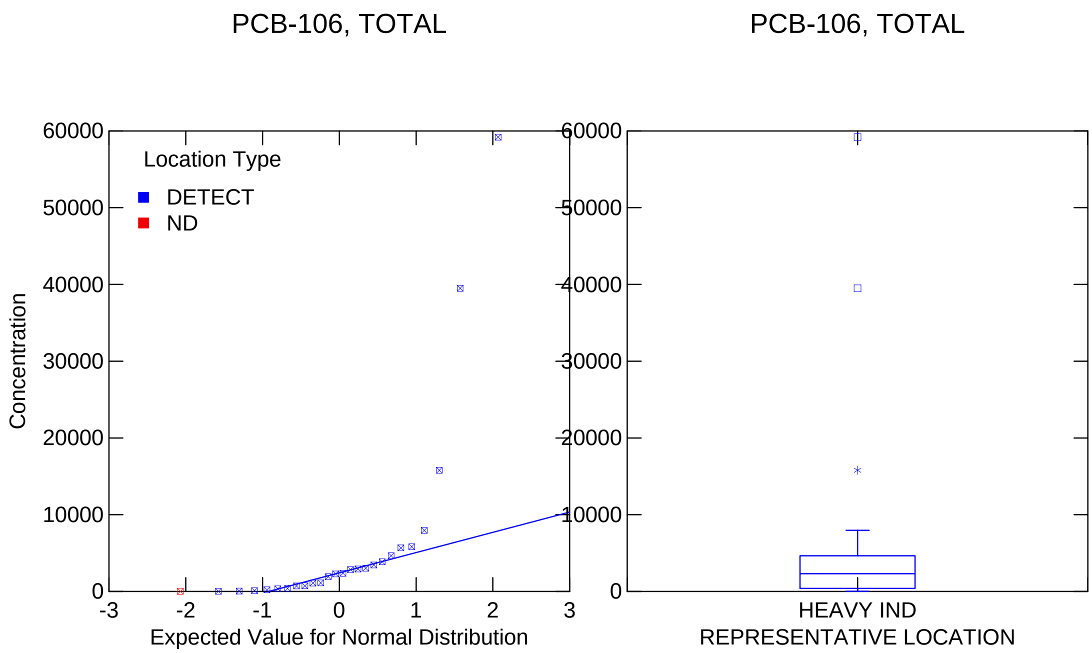
PCB-066, TOTAL



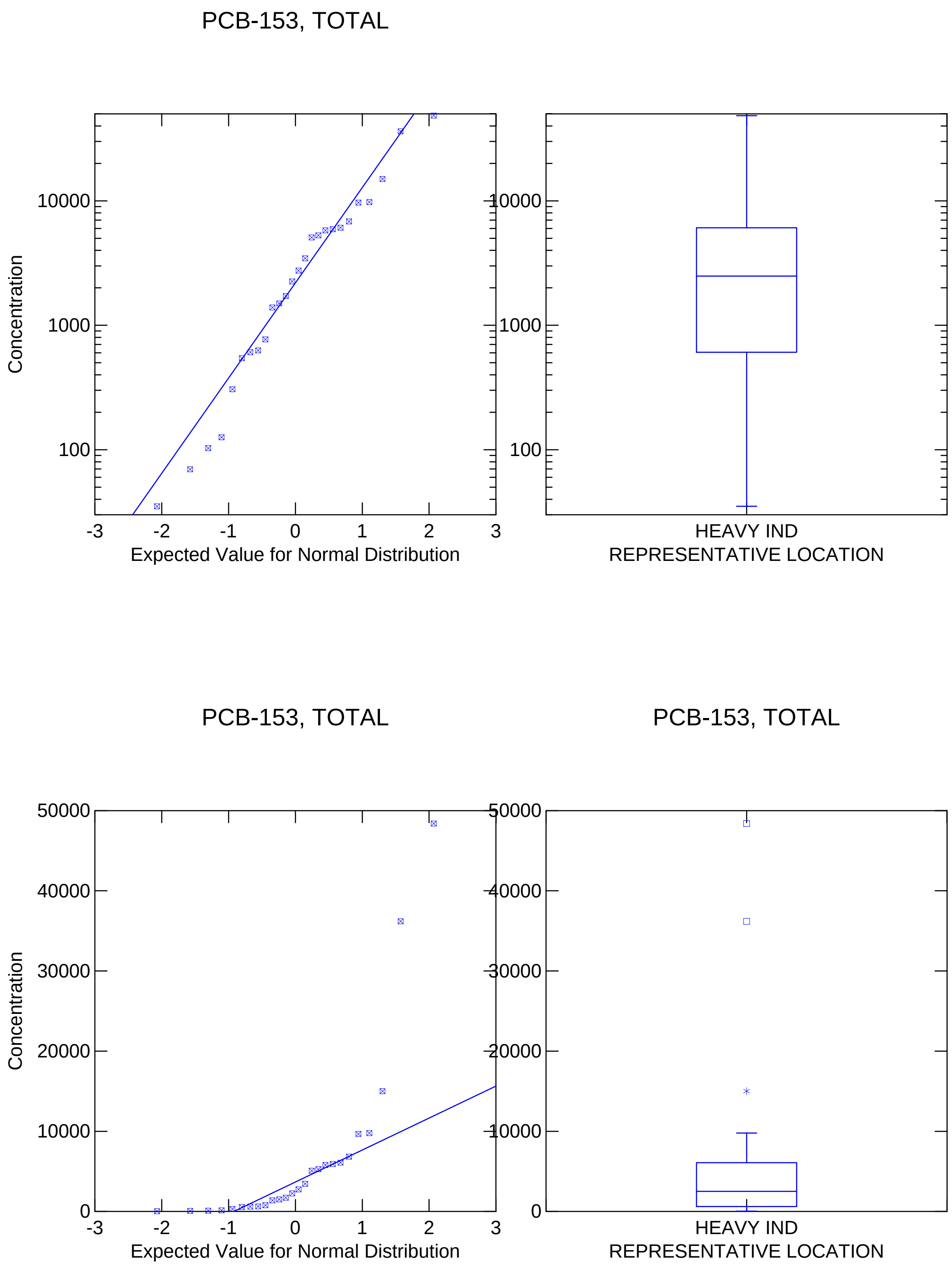


PCB-106, TOTAL

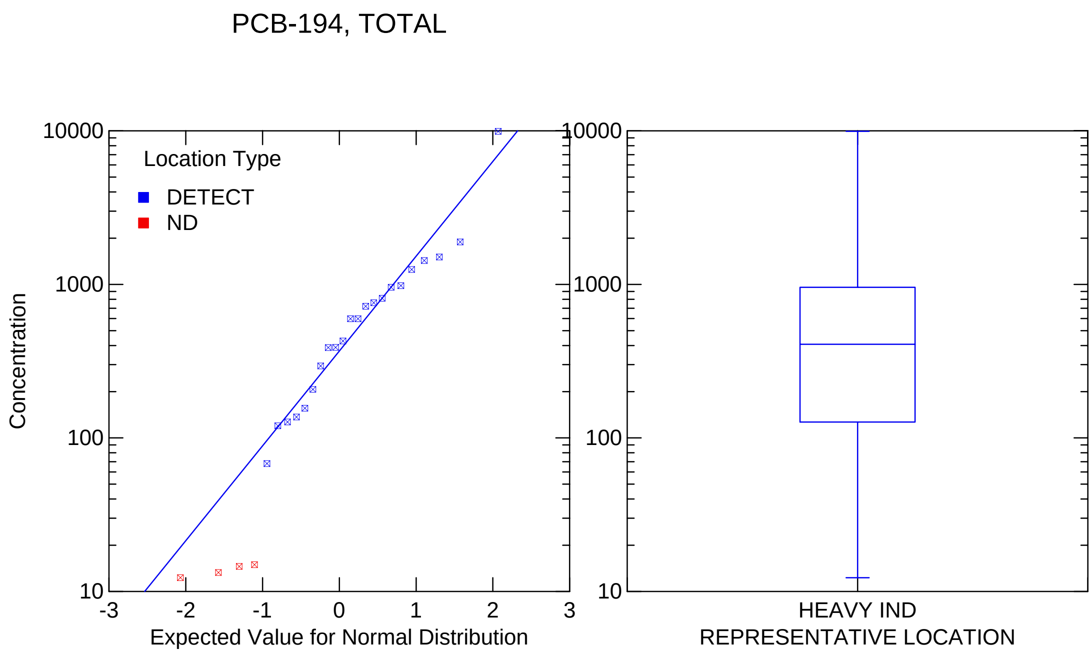


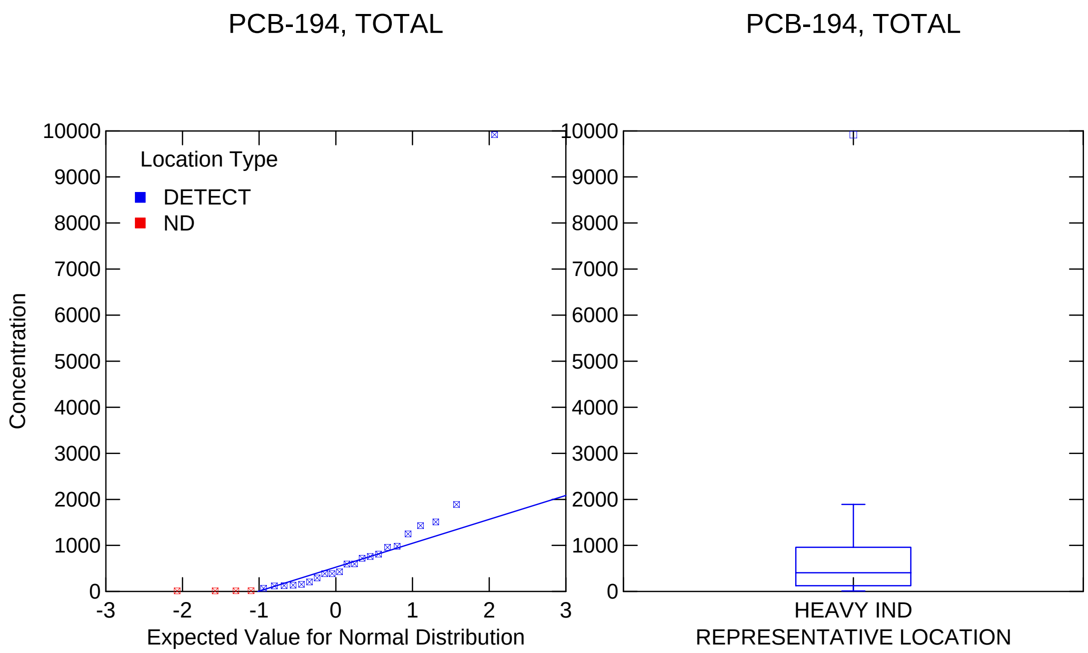


PCB-153, TOTAL

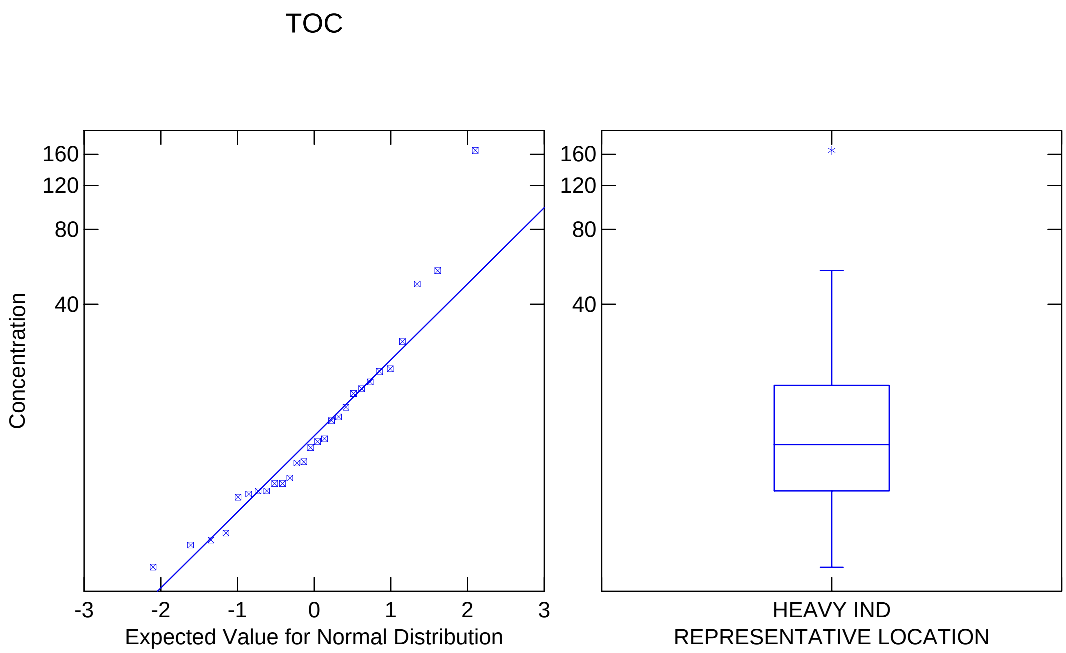


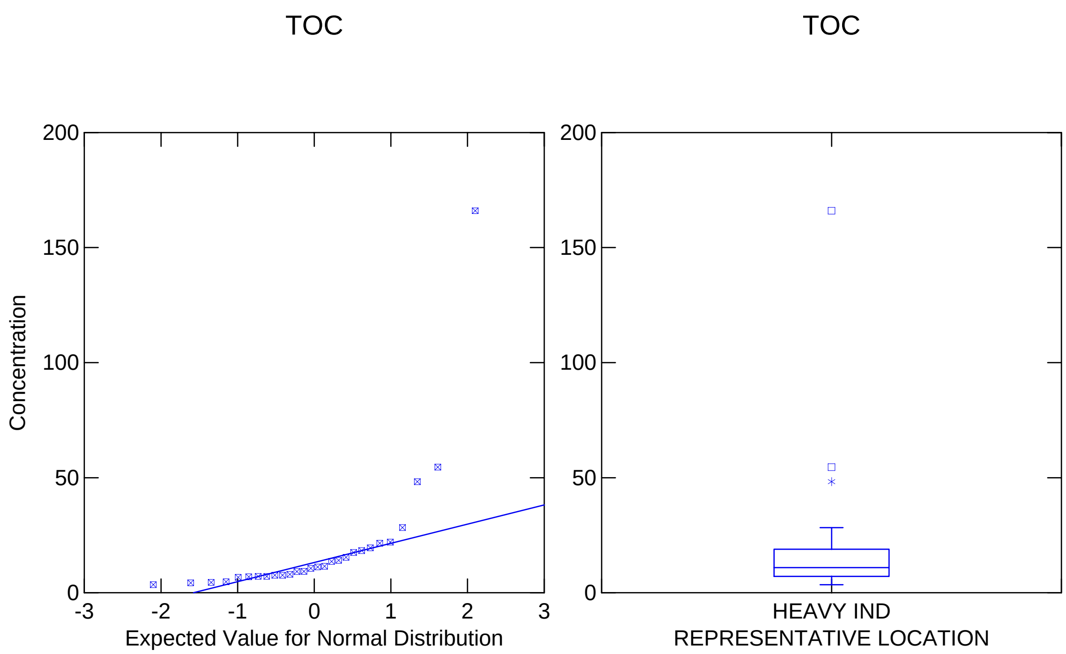
PCB-194, TOTAL





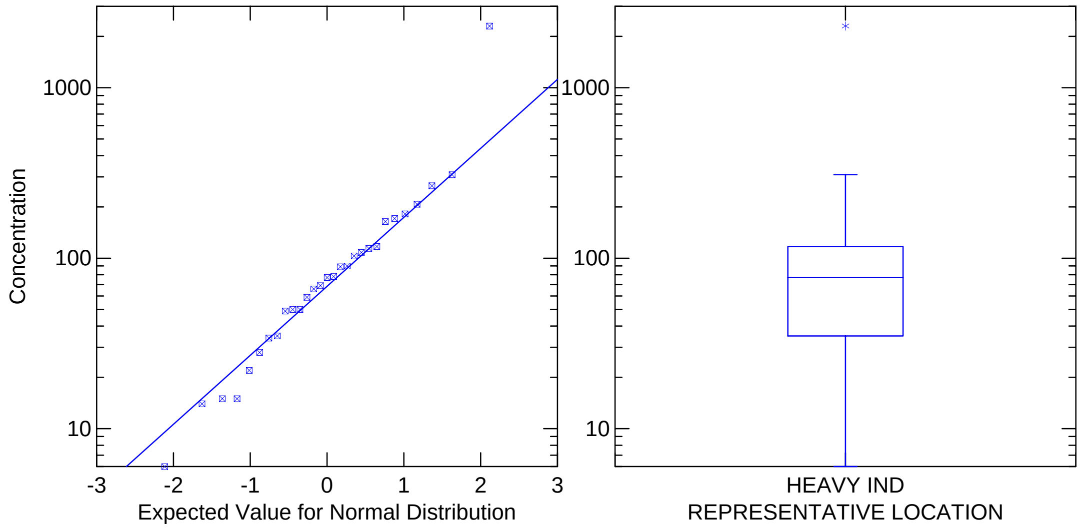
TOC


TOC
Concentration
160
120
80
40
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
HEAVY IND
REPRESENTATIVE LOCATION


TOC
TOC
Concentration
200
150
100
50
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
HEAVY IND
REPRESENTATIVE LOCATION

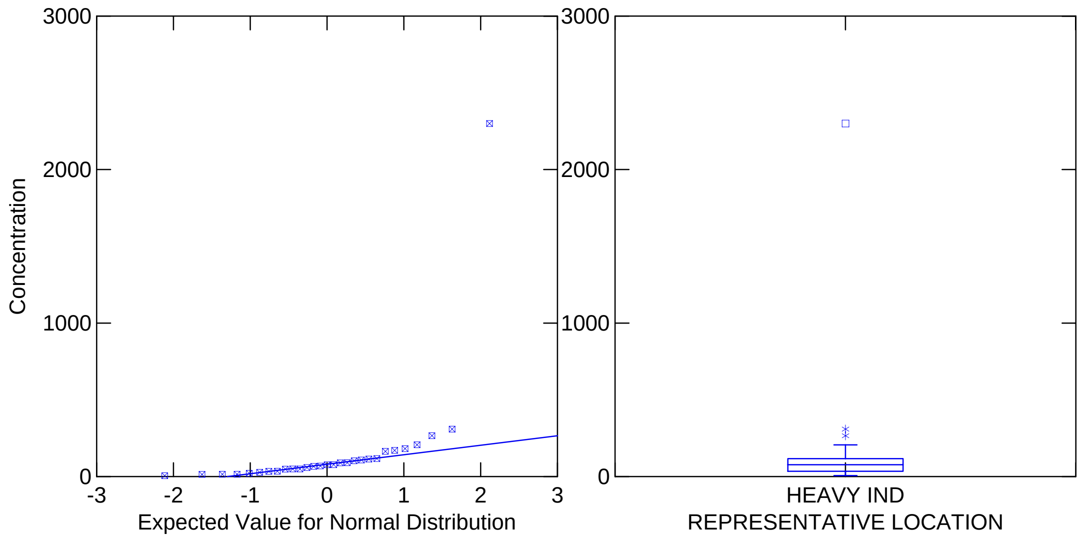
TSS

TSS



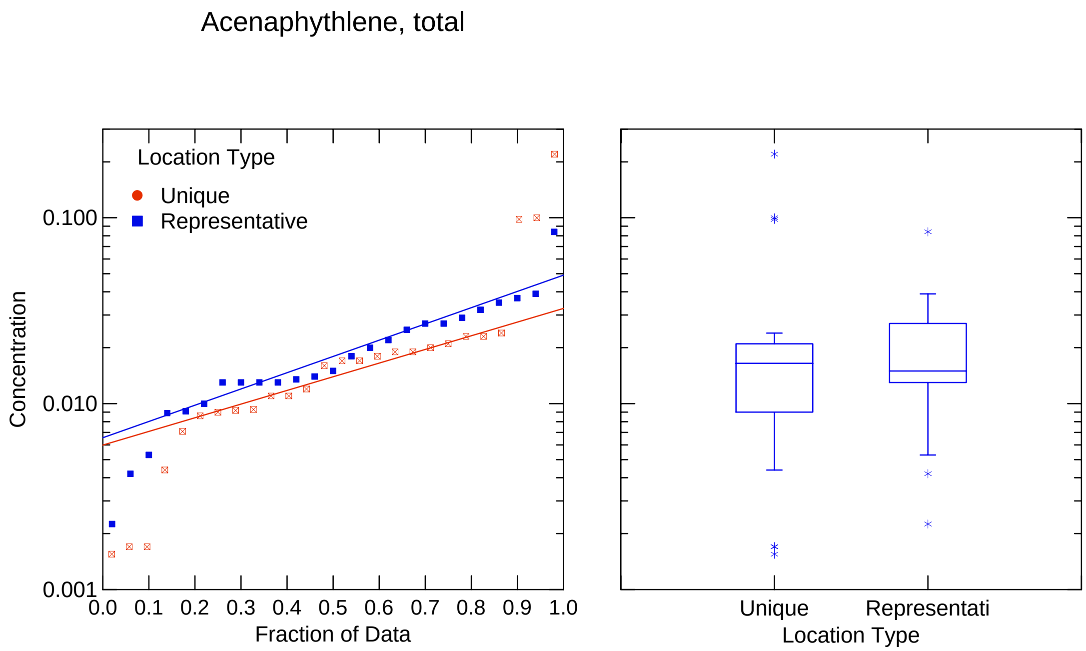
TSS

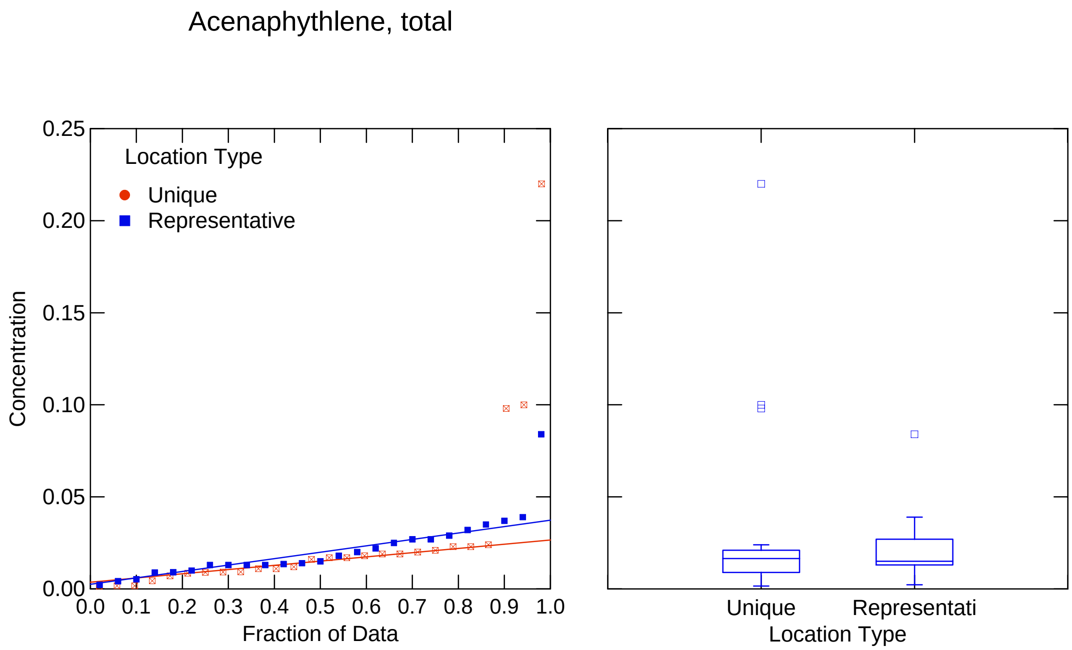
TSS



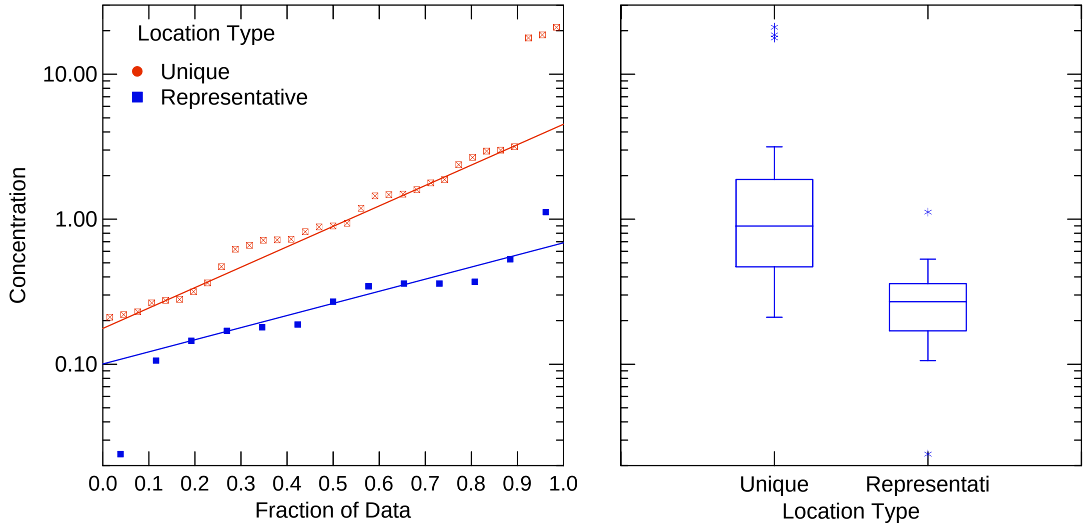
Appendix A-3

Graphical Comparison between Unique and Representative Heavy Industrial Data Distributions

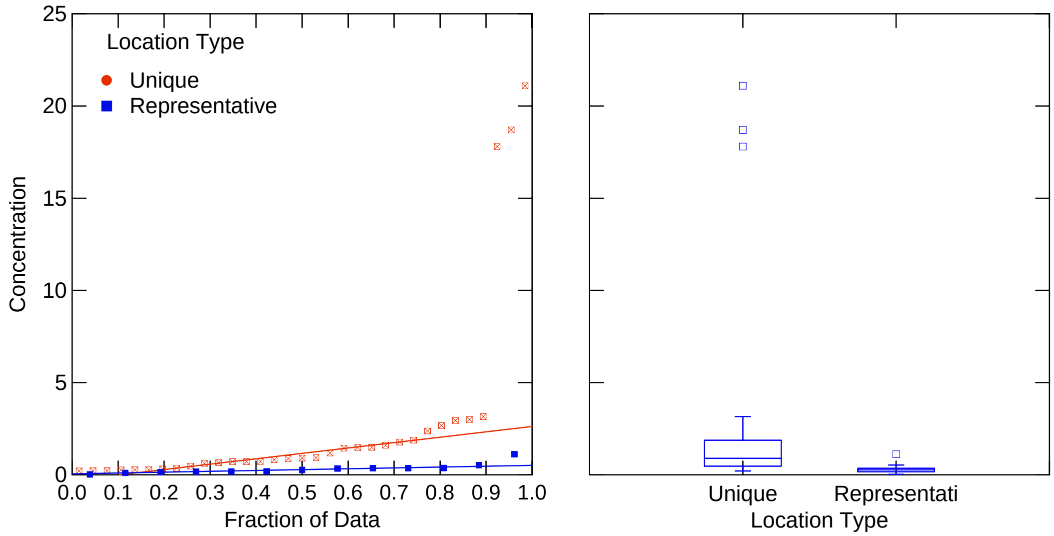

Acenaphythlene, total
Location Type
Unique
Representative
Concentration
0.001
0.010
0.100
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

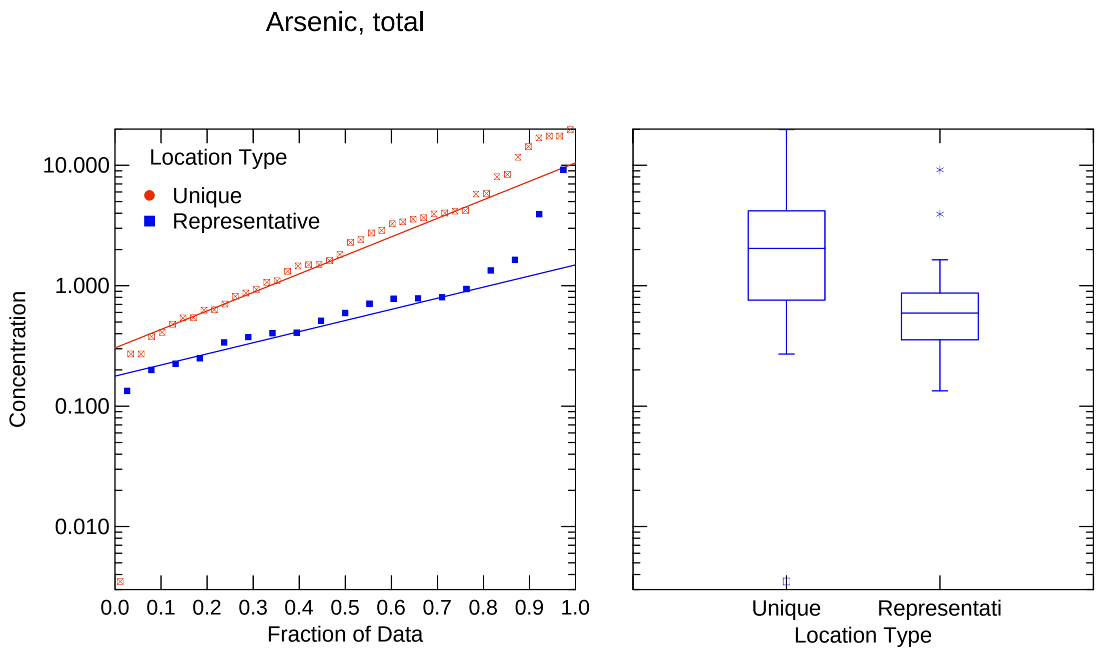

Acenaphythlene, total
Location Type
Unique
Representative
Concentration
0.00
0.05
0.10
0.15
0.20
0.25
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

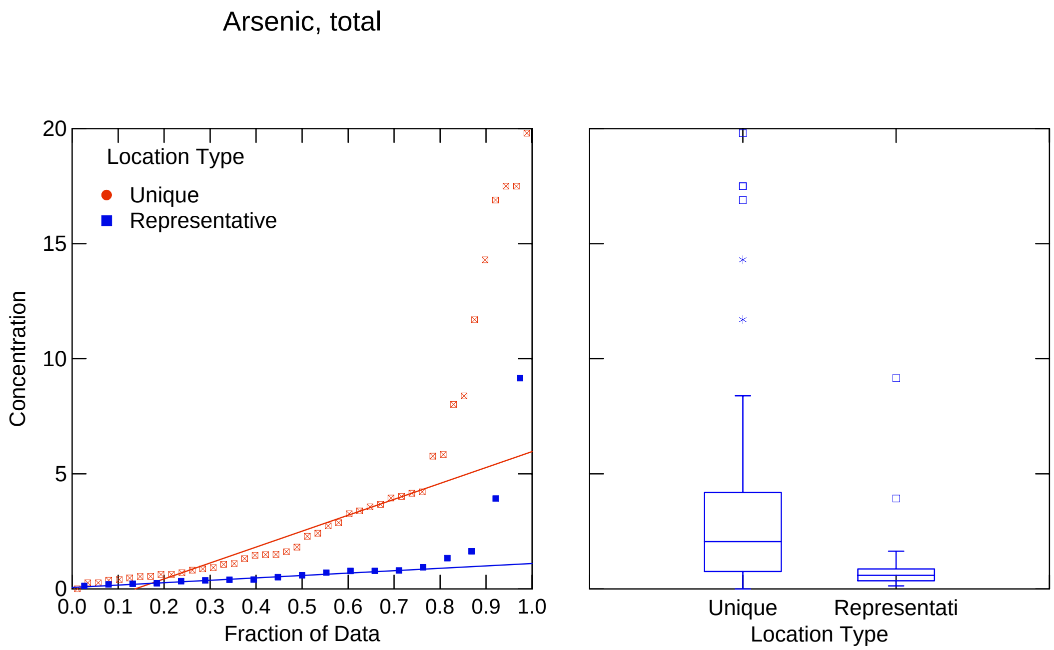
Arsenic, dissolved

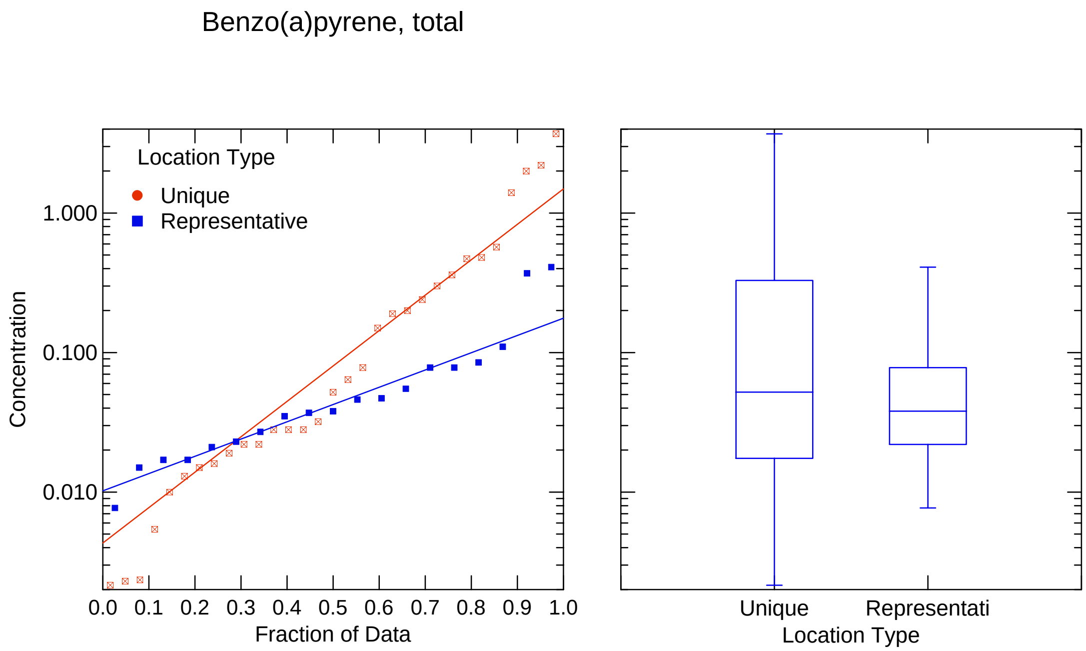


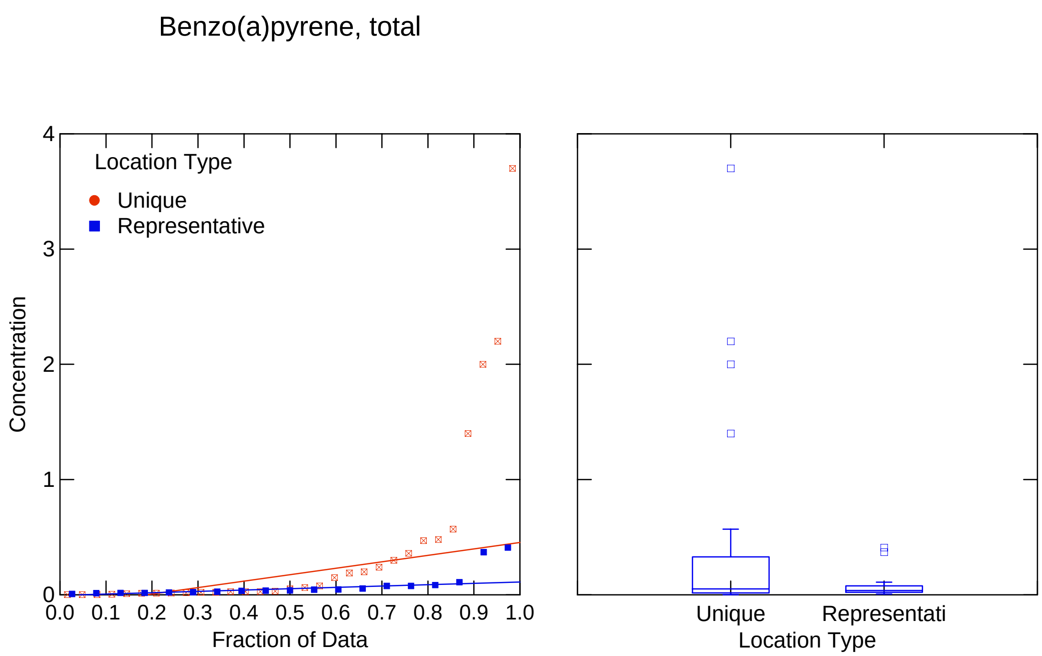
Arsenic, dissolved



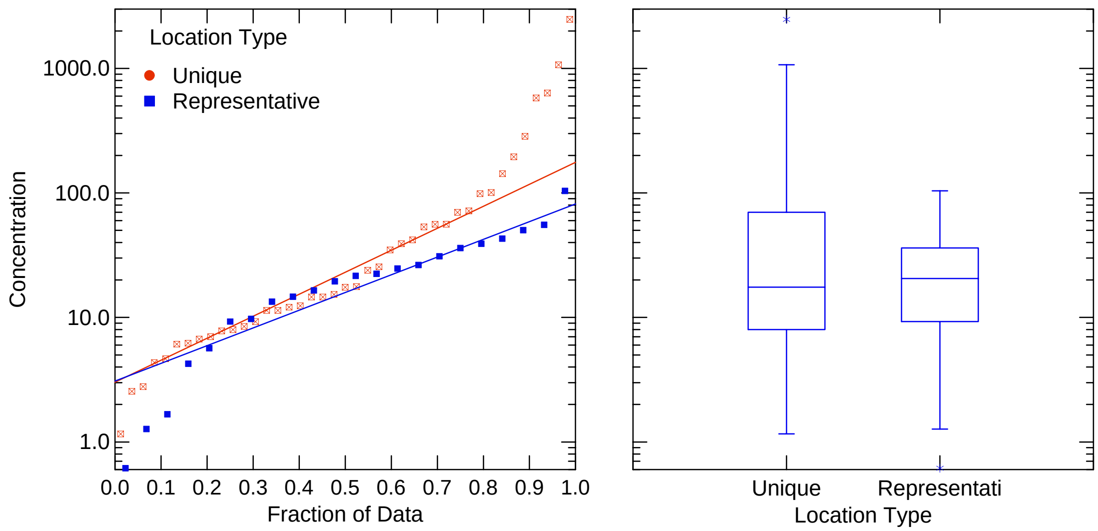

Arsenic, total
Location Type
Unique
Representative
Concentration
10.000
1.000
0.100
0.010
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type


Arsenic, total
Location Type
Unique
Representative
Concentration
20
15
10
5
0
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

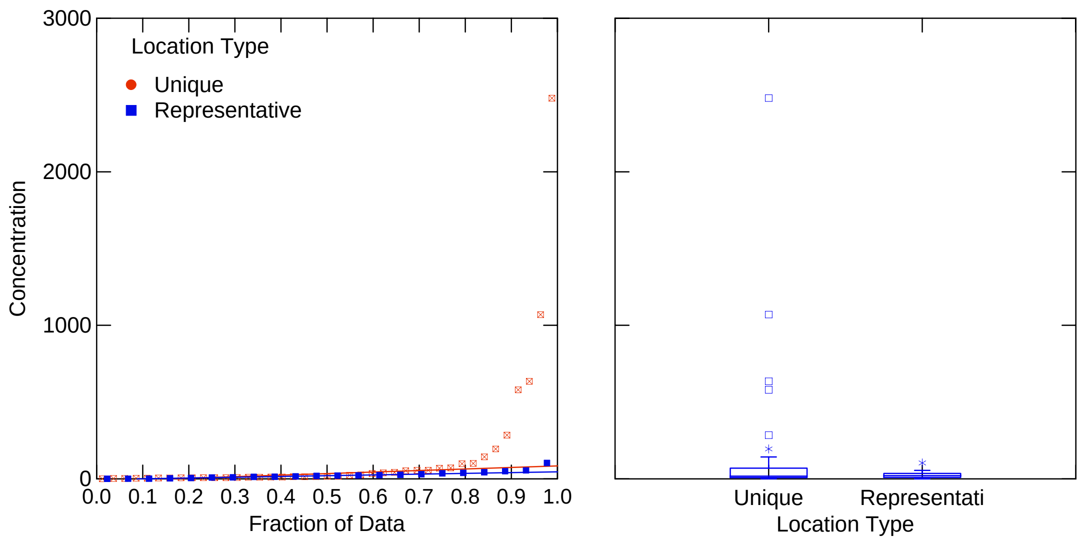

Benzo(a)pyrene, total
Location Type
Unique
Representative
Concentration
1.000
0.100
0.010
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

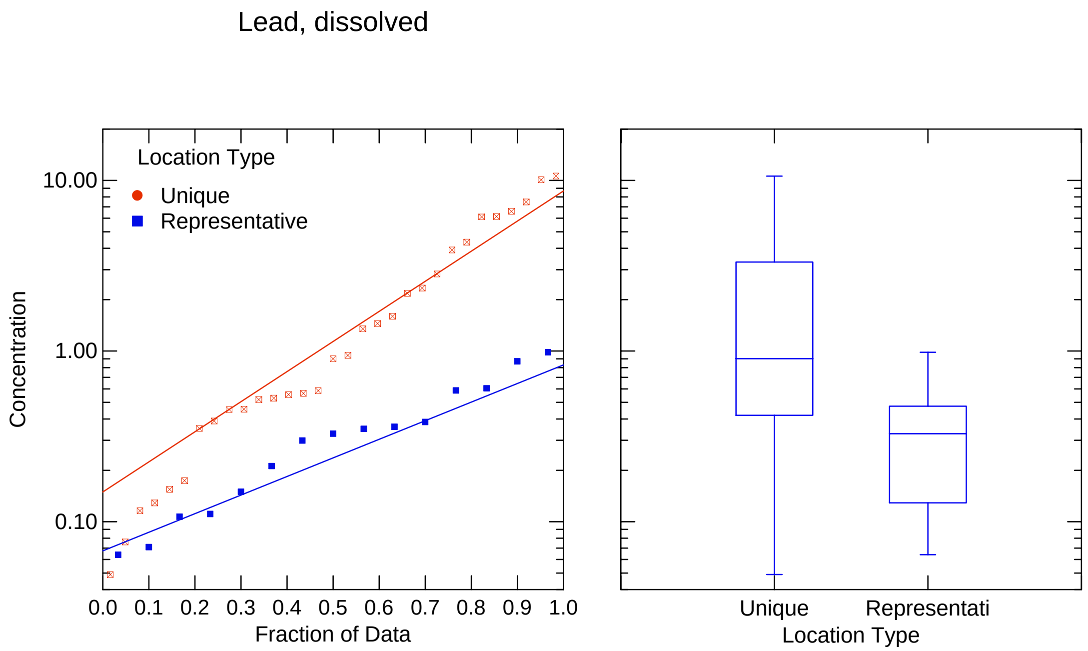

Benzo(a)pyrene, total
Location Type
Unique
Representative
Concentration
4
3
2
1
0
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

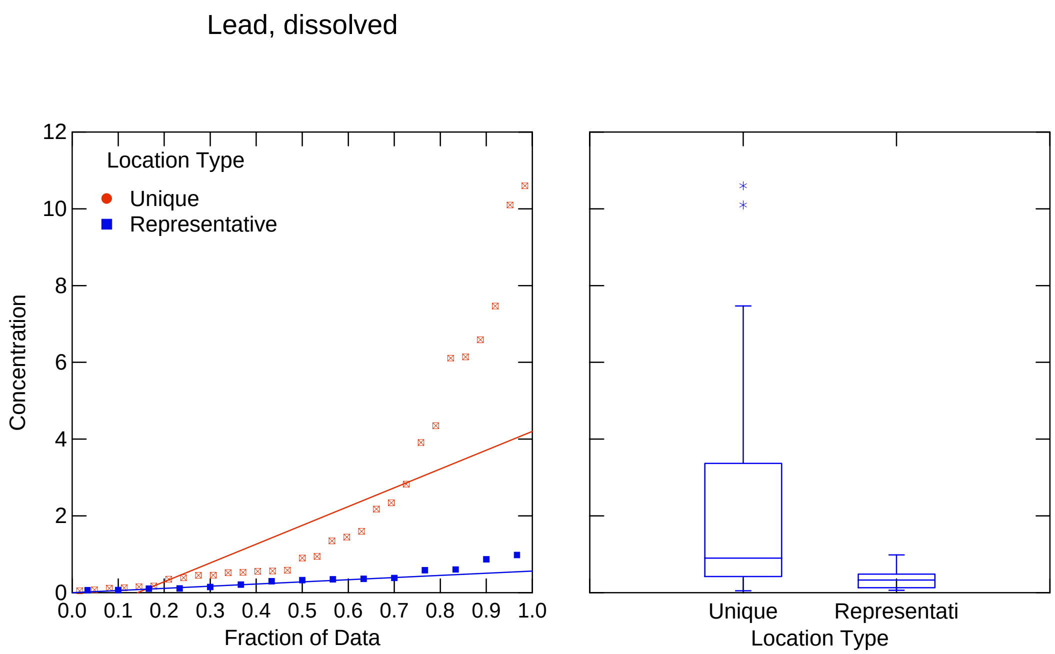
Lead, total



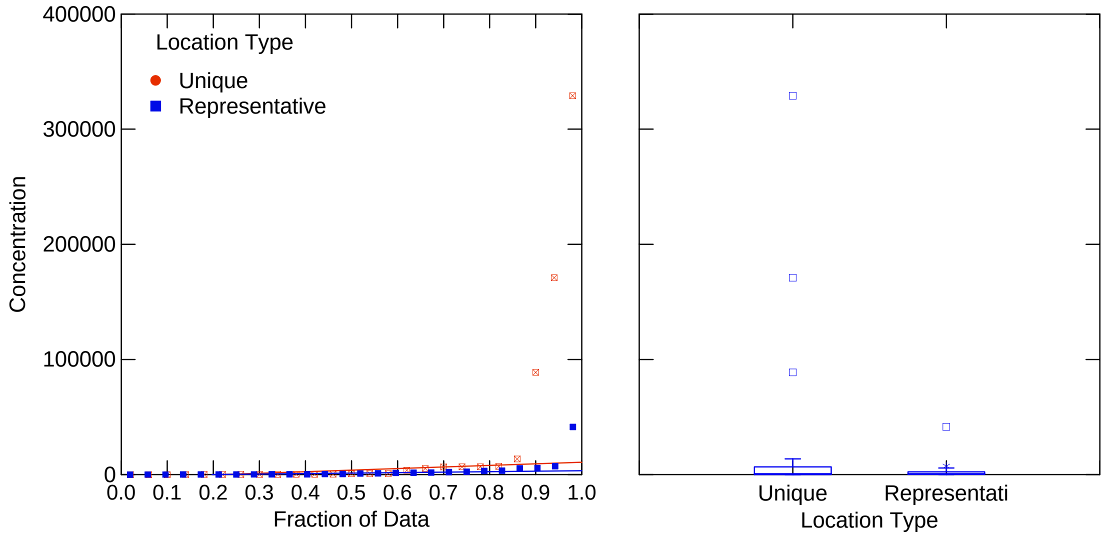
Lead, total



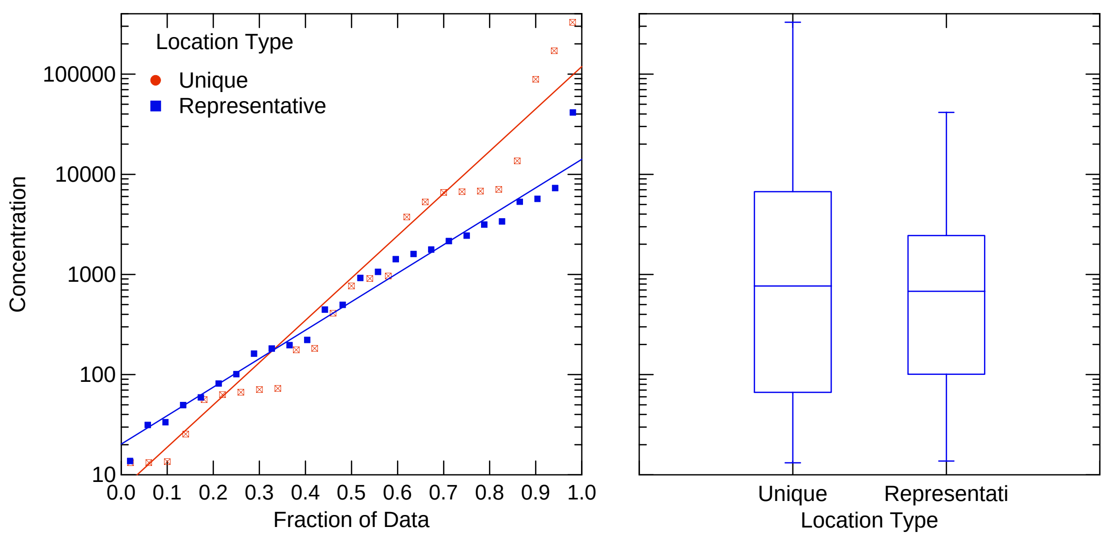

Lead, dissolved
Location Type
Unique
Representative
Concentration
10.00
1.00
0.10
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

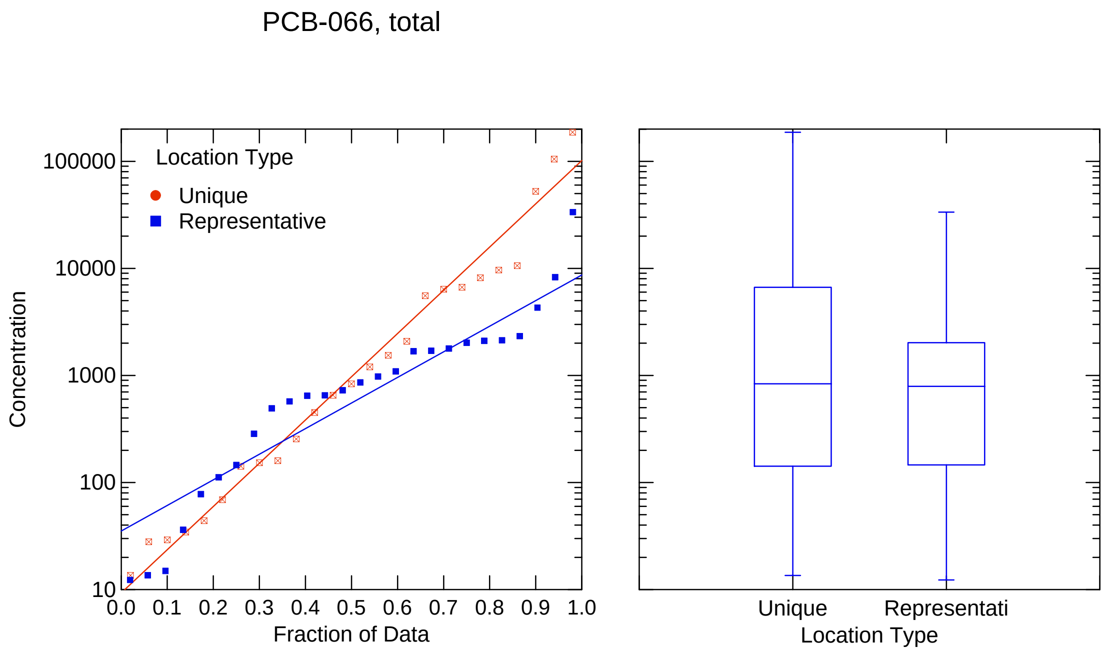

Lead, dissolved
Location Type
Unique
Representative
Concentration
12
10
8
6
4
2
0
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

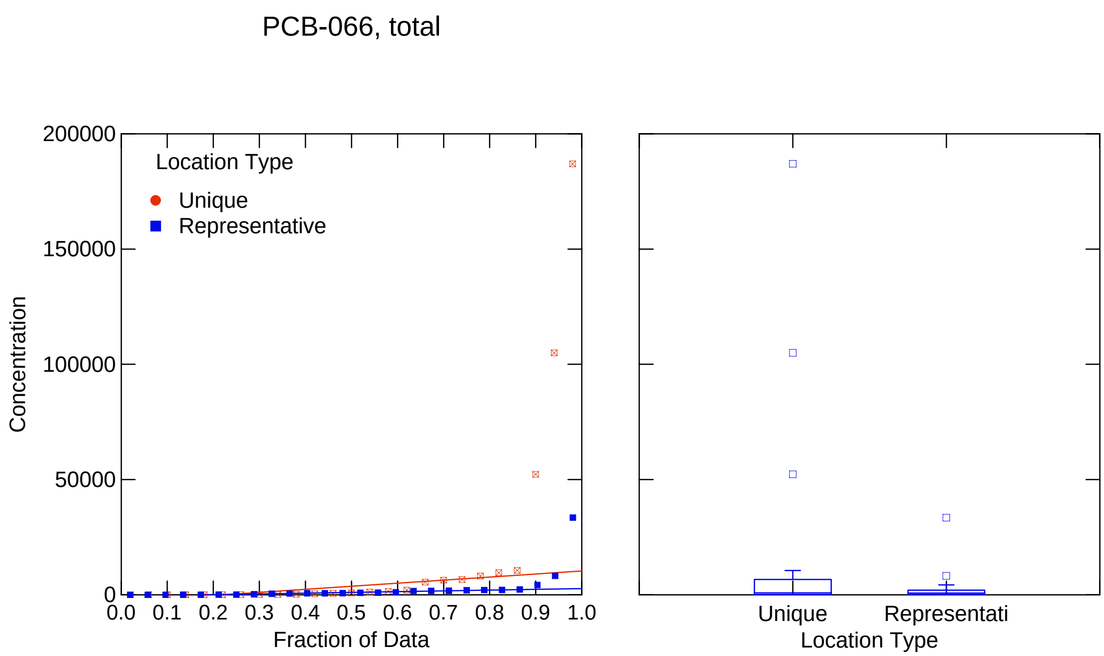
PCB-018, total



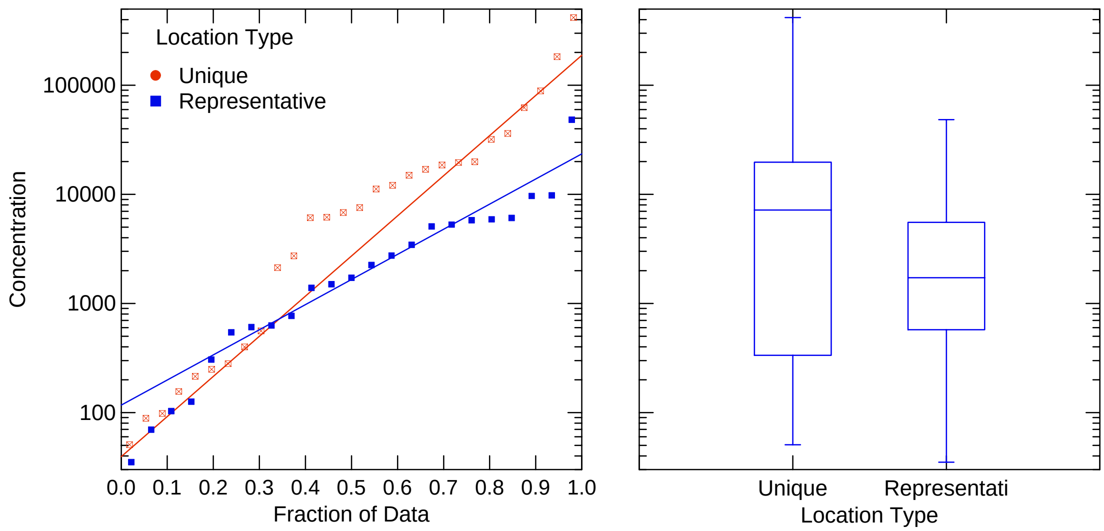
PCB-018, total



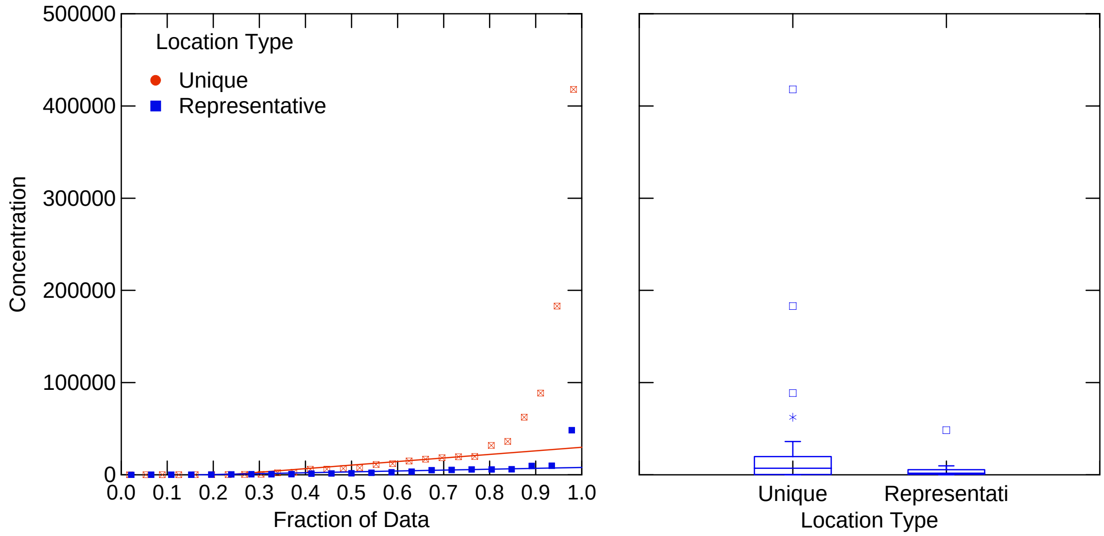

PCB-066, total
Location Type
Unique
Representative
Concentration
100000
10000
1000
100
10
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type


PCB-066, total
Location Type
Unique
Representative
Concentration
200000
150000
100000
50000
0
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

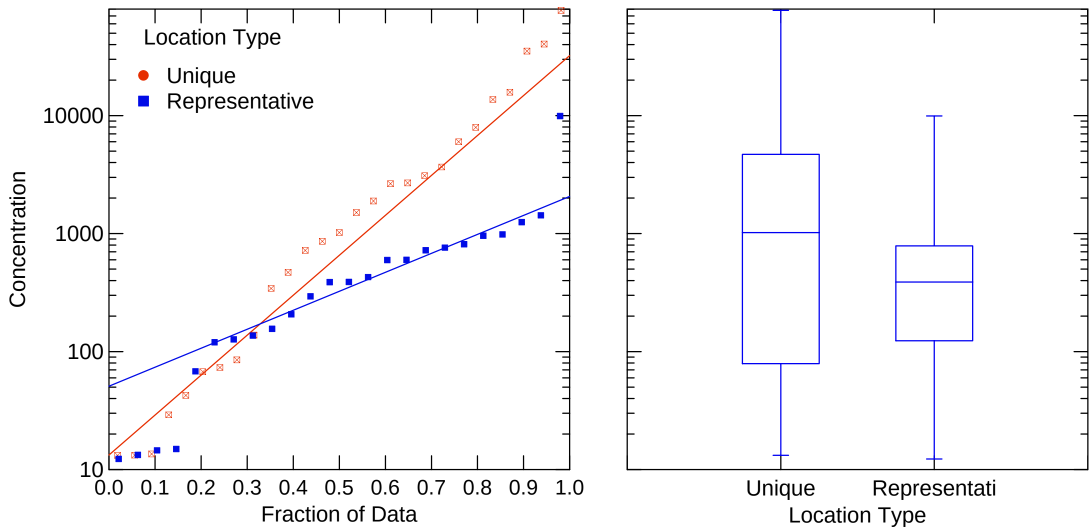
PCB-153, total



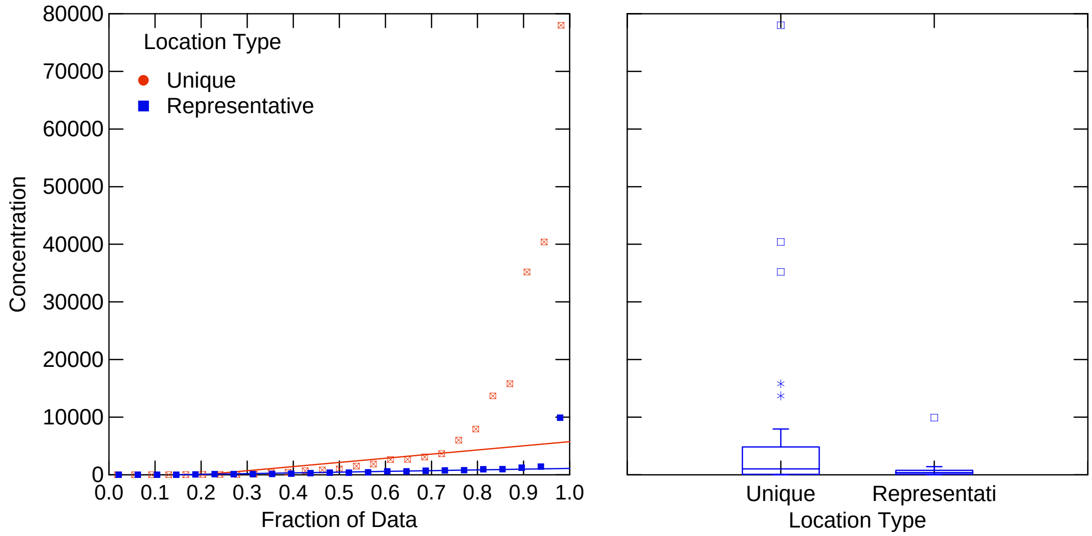
PCB-153, total

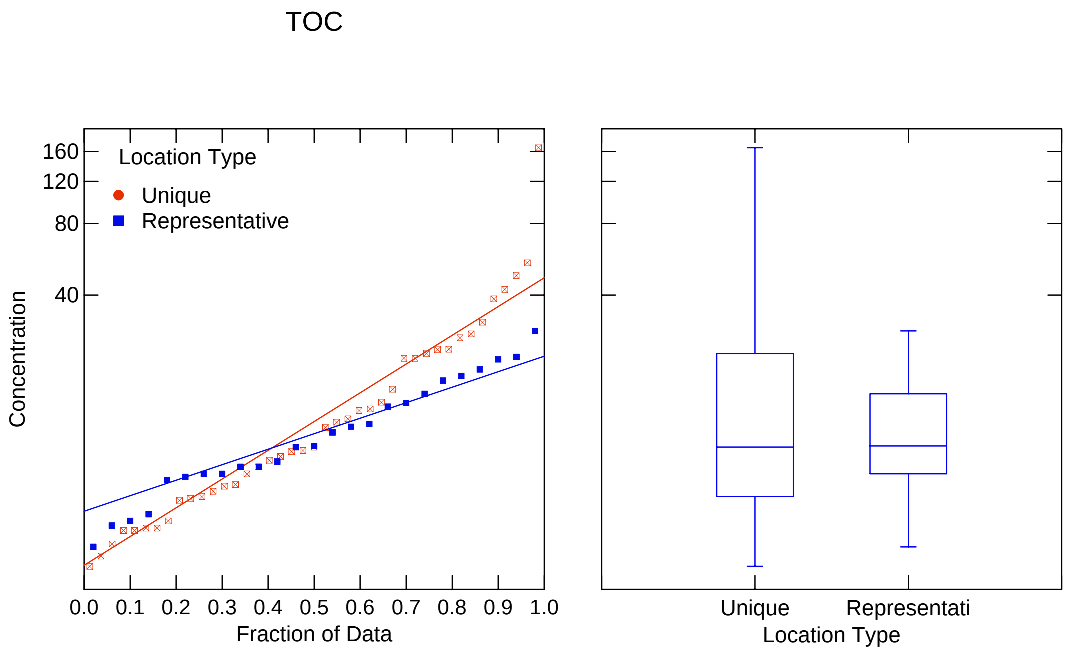


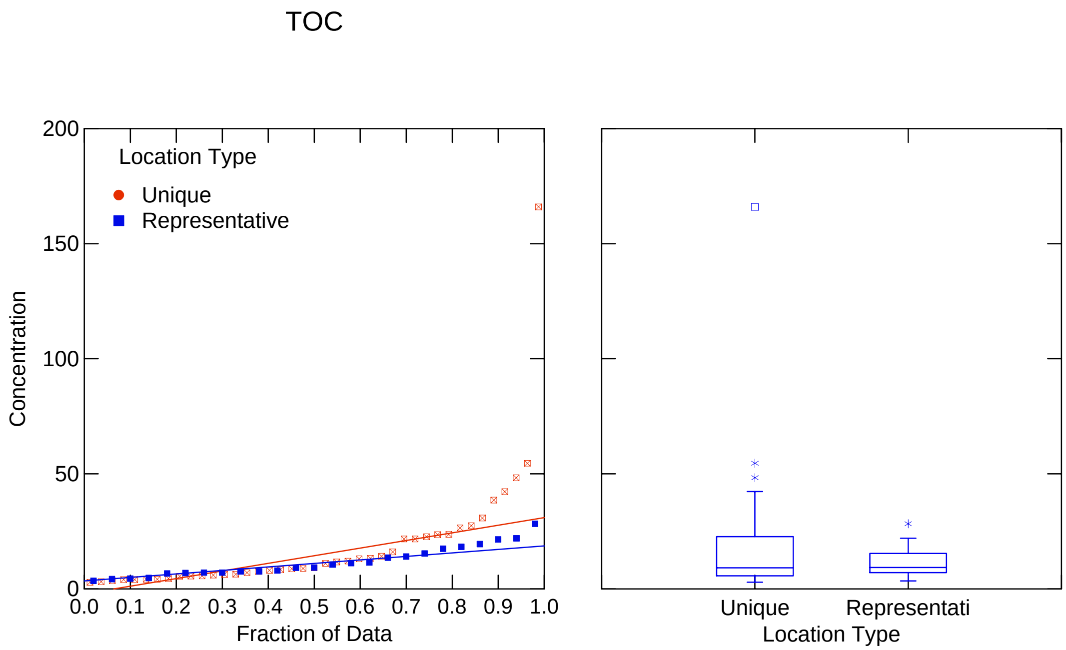
PCB-194, total



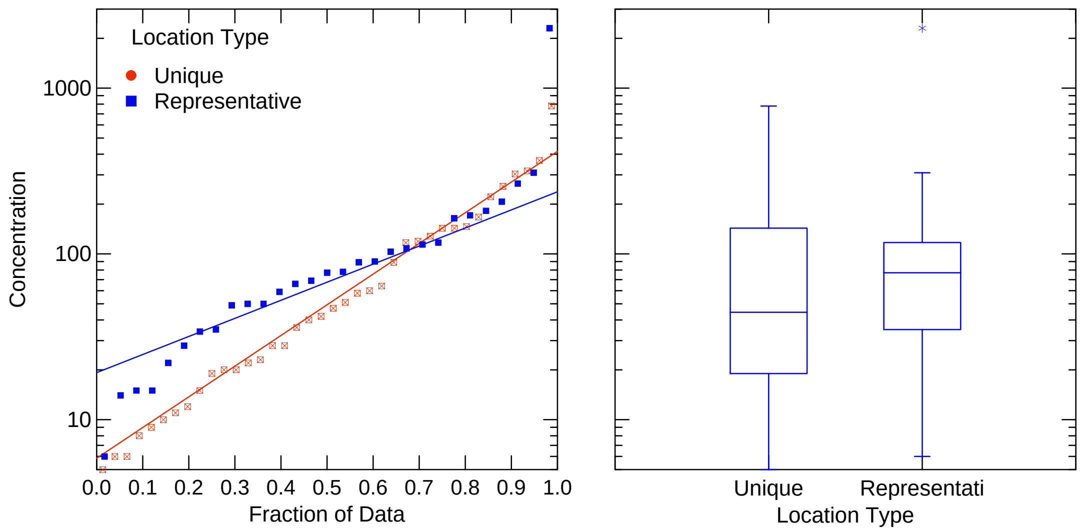
PCB-194, total



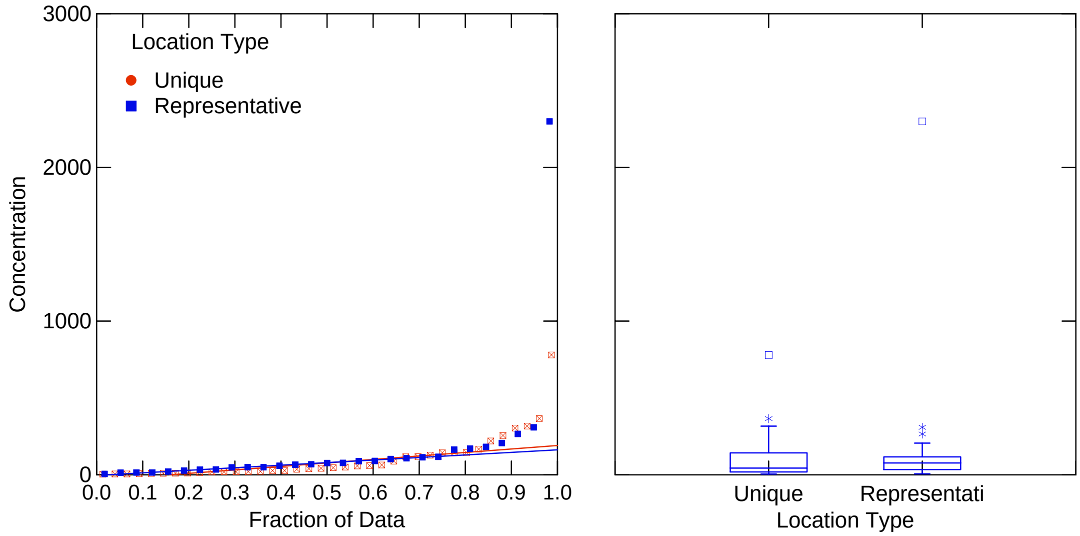

TOC
Location Type
Unique
Representative
160
120
80
40
Concentration
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

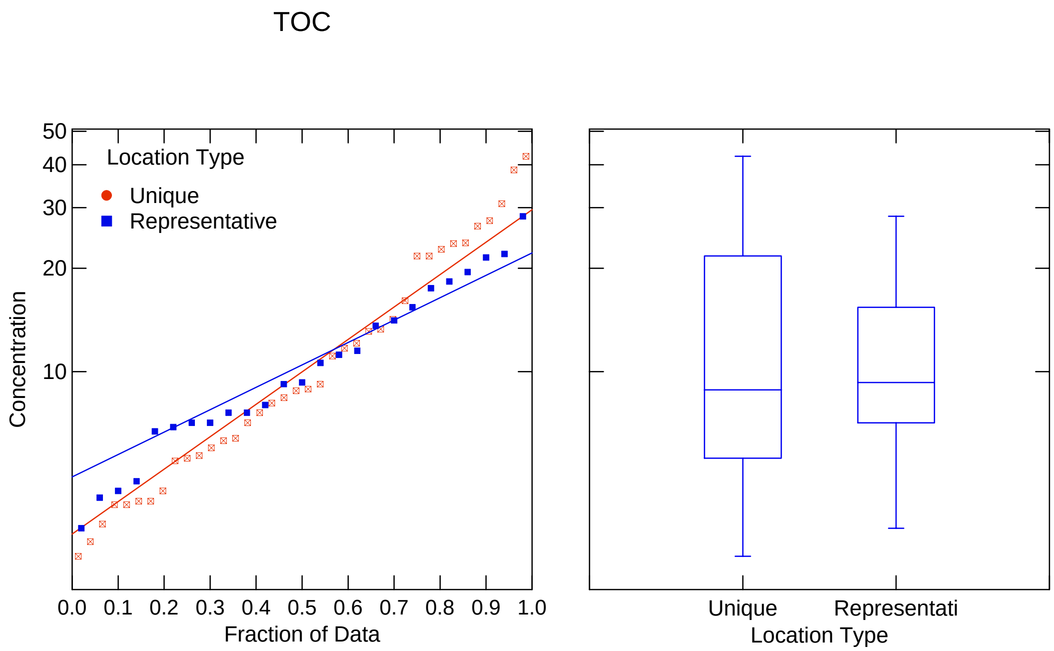

TOC
200
150
100
50
0
Location Type
Unique
Representative
Concentration
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
Unique
Representati
Location Type

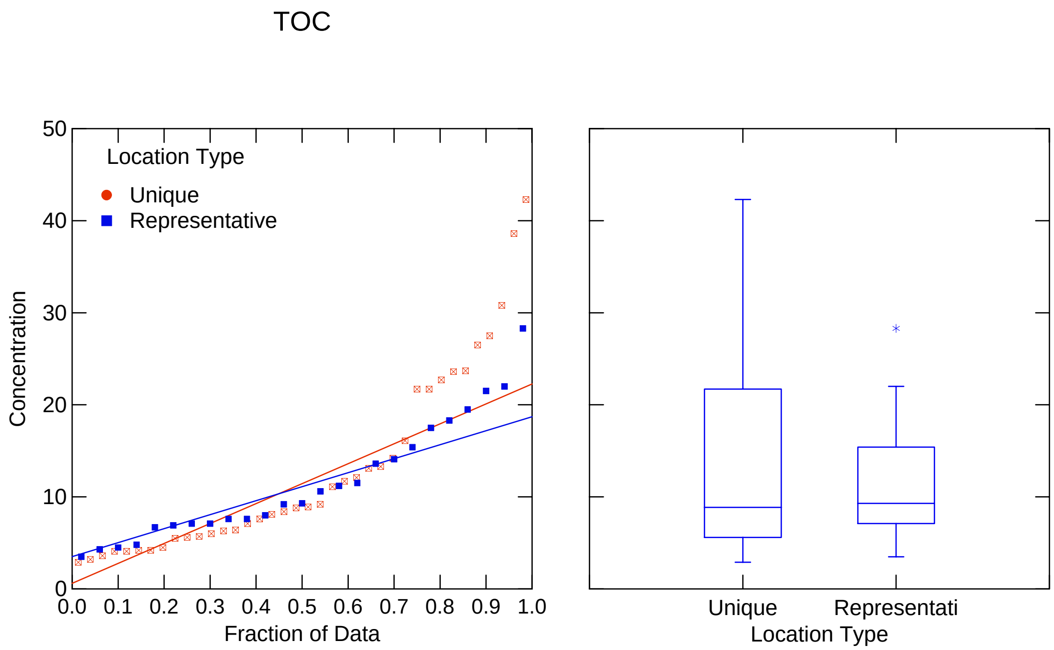
TSS


Location Type
Unique
Representative
1000
100
10
Concentration
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Fraction of Data
Unique
Representati
Location Type

TSS


Location Type
Unique
Representative
3000
2000
1000
0
Concentration
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Fraction of Data
Unique
Representati
Location Type


TOC
Location Type
Unique
Representative
Concentration
50
40
30
20
10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Fraction of Data
Unique
Representati
Location Type

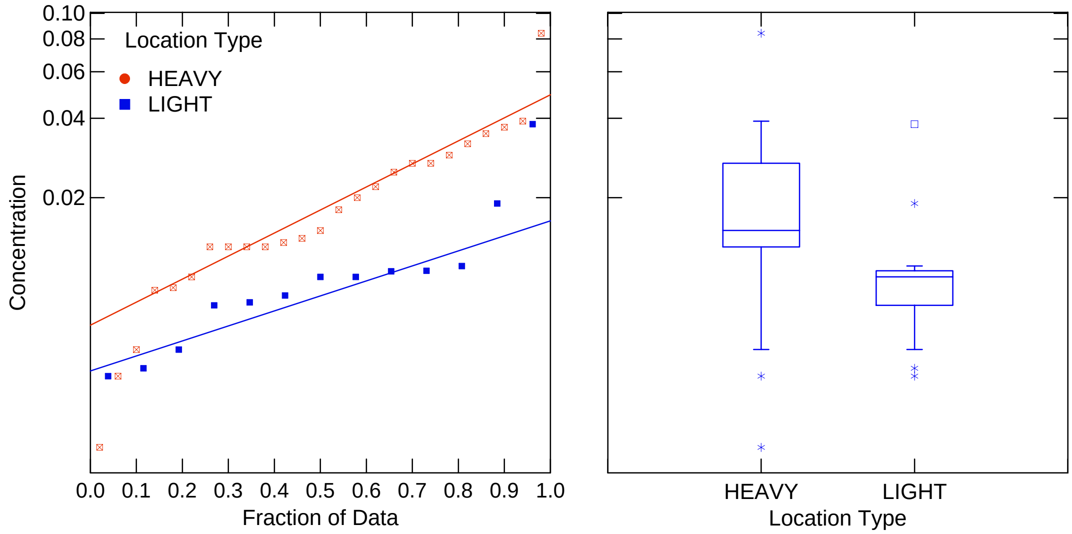

TOC
Location Type
Unique
Representative
Concentration
50
40
30
20
10
0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Fraction of Data
Unique
Representati
Location Type

Appendix A-4

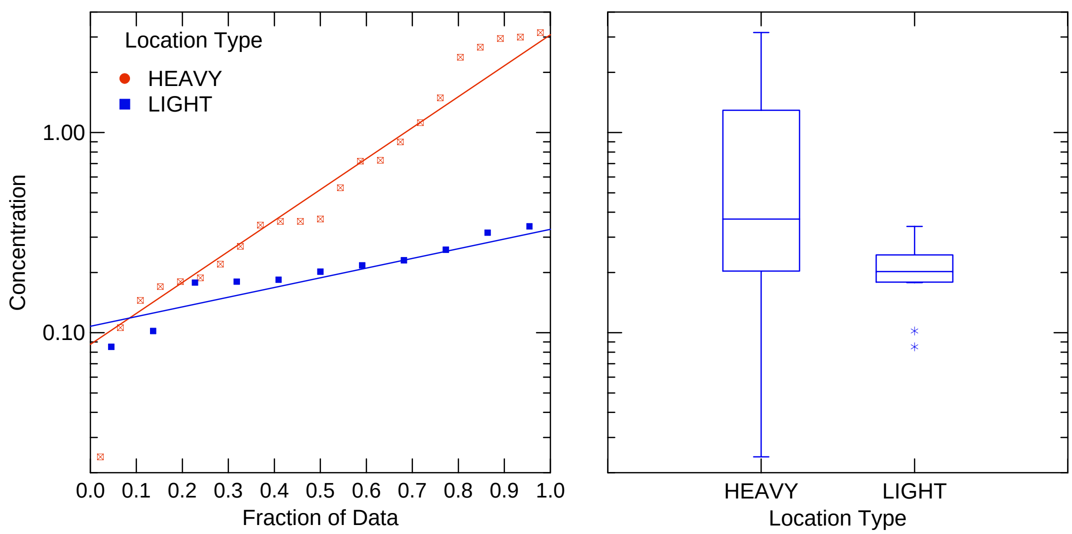
Graphical Comparison of Representative Heavy Industrial and Light Industrial Data Distributions

Original Data Classification Plots

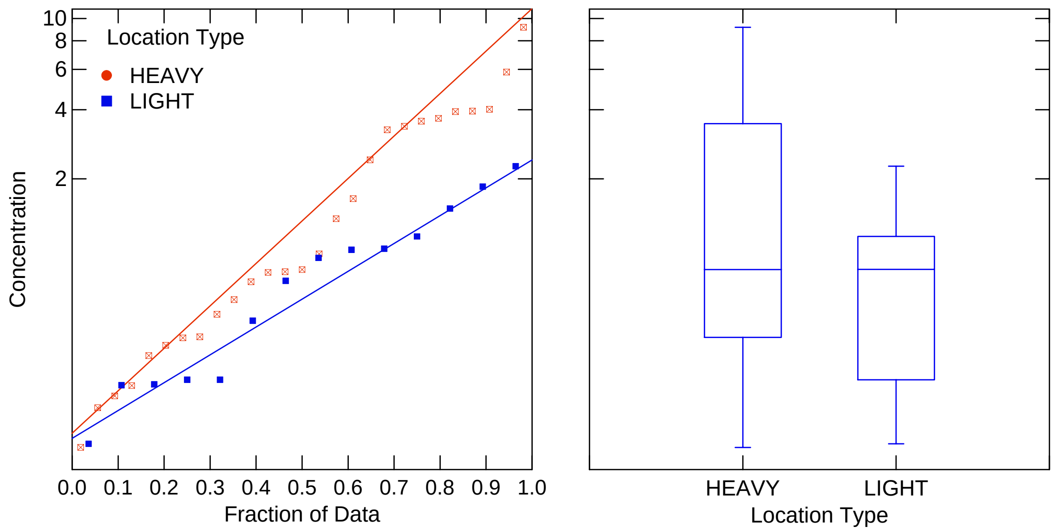
Acenaphythlene, Total



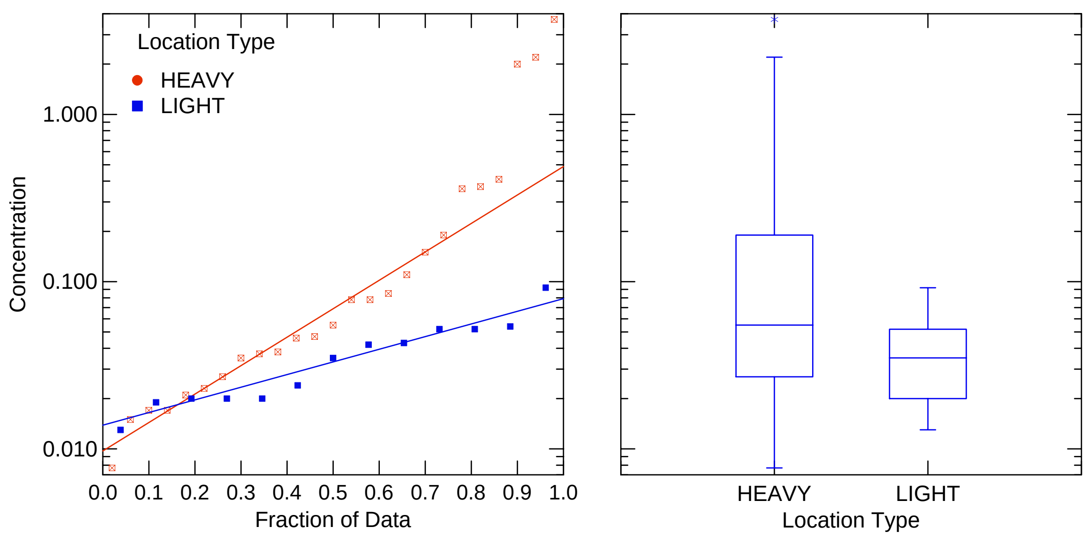
Arsenic, dissolved



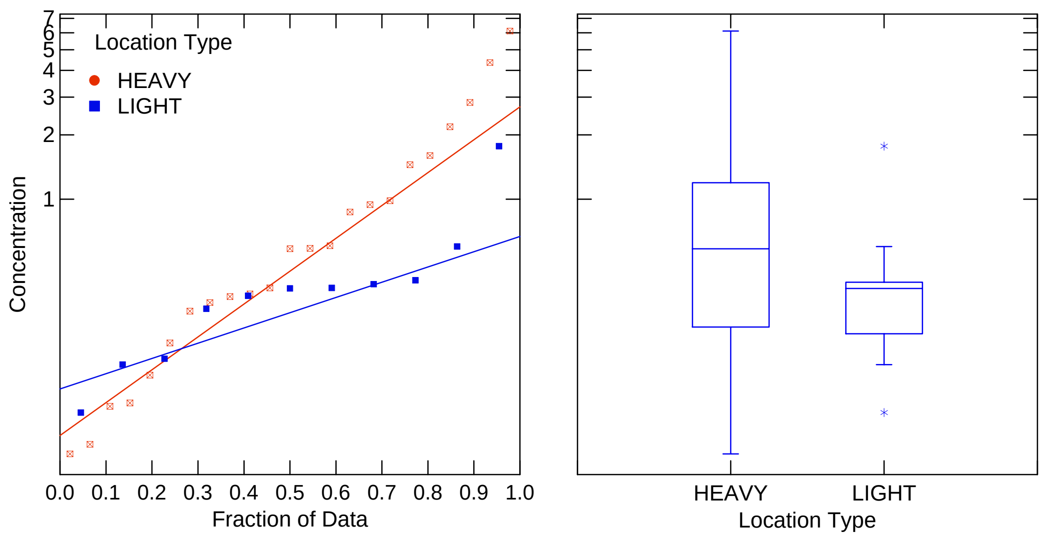
Arsenic, total



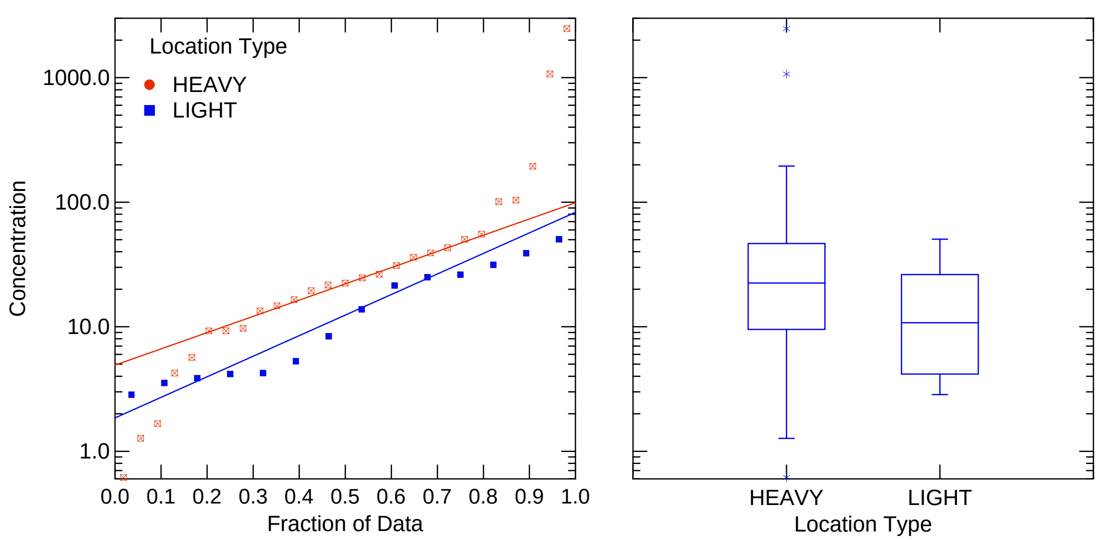
Benzo(a)pyrene, total



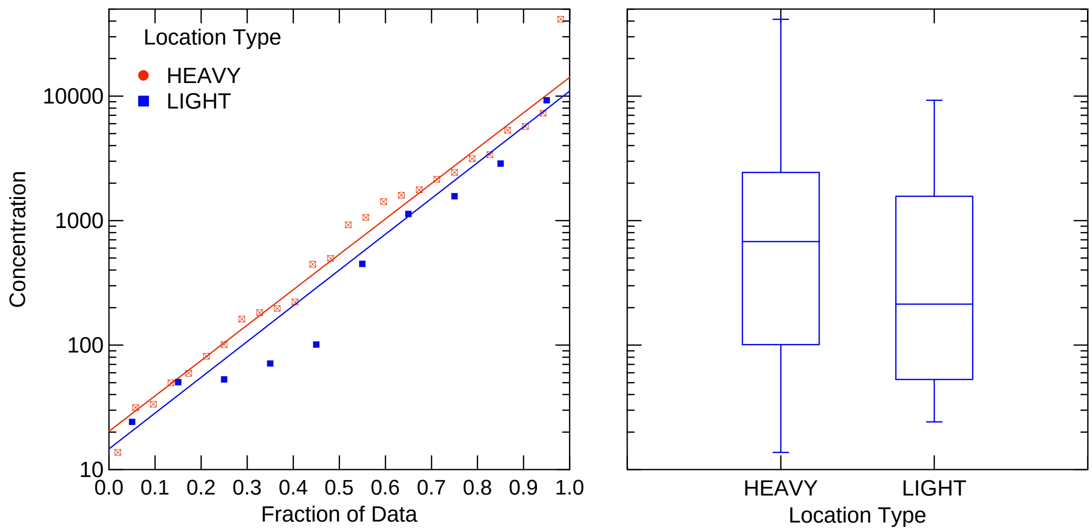
Lead, dissolved



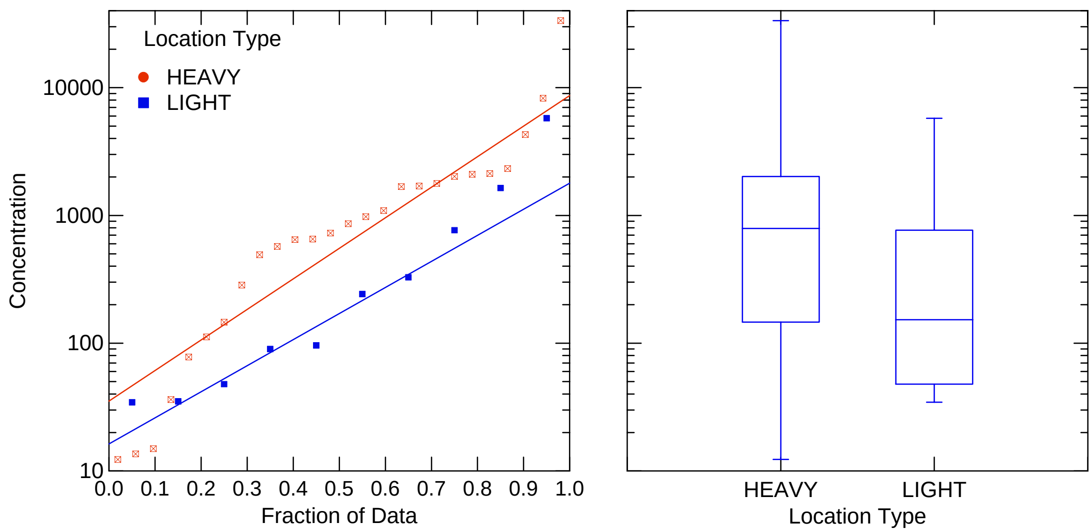
Lead, total



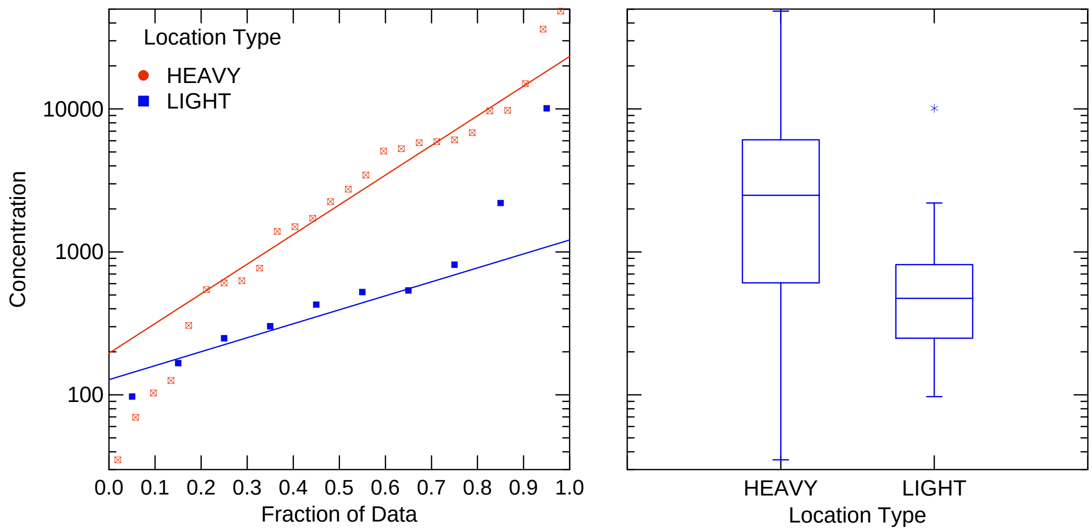
PCB-018, total



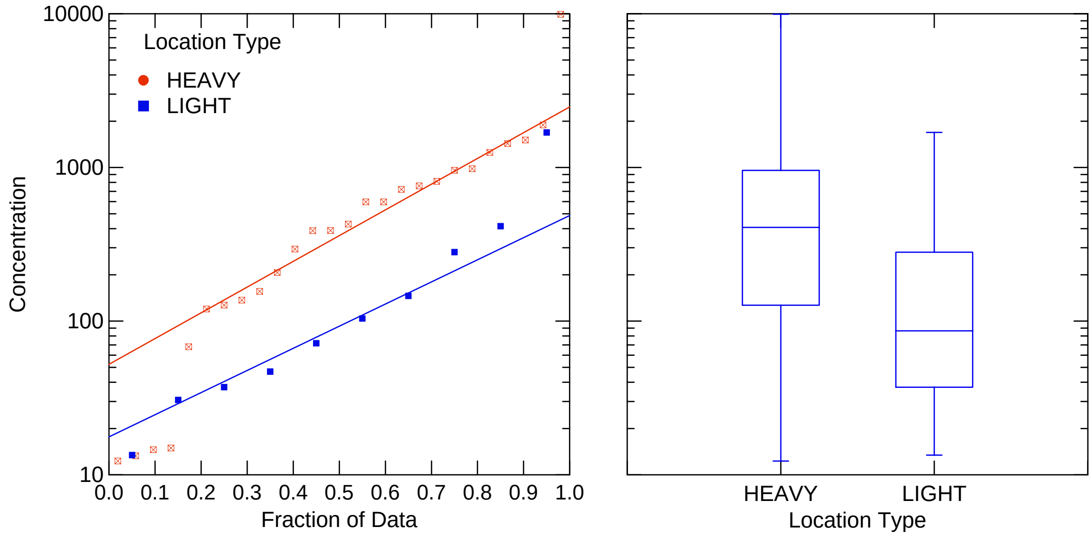
PCB-066, total

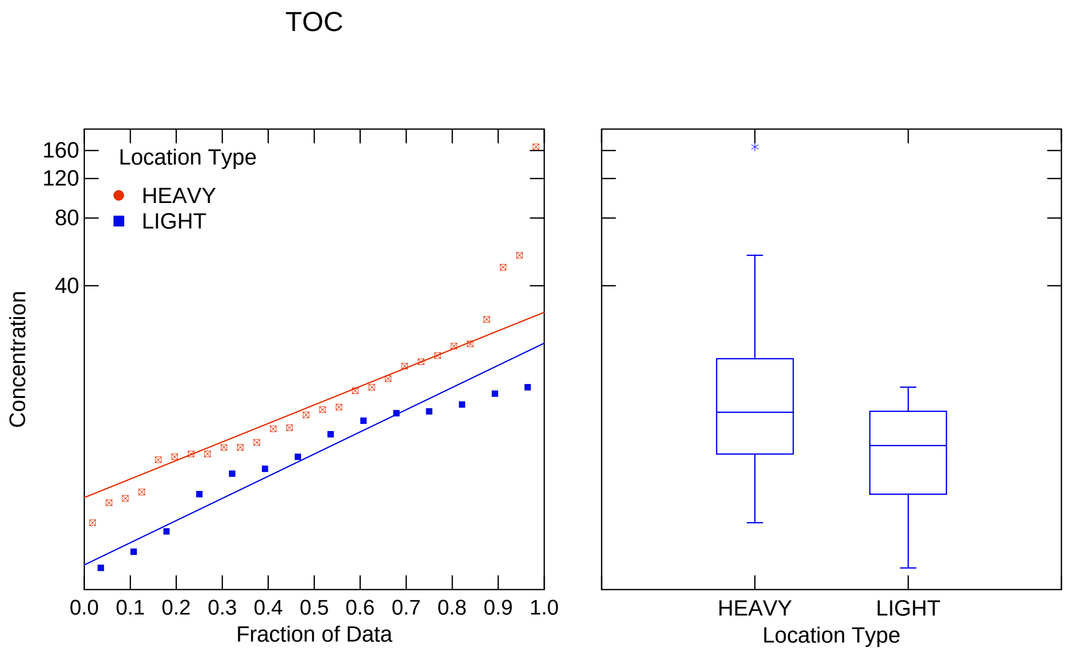


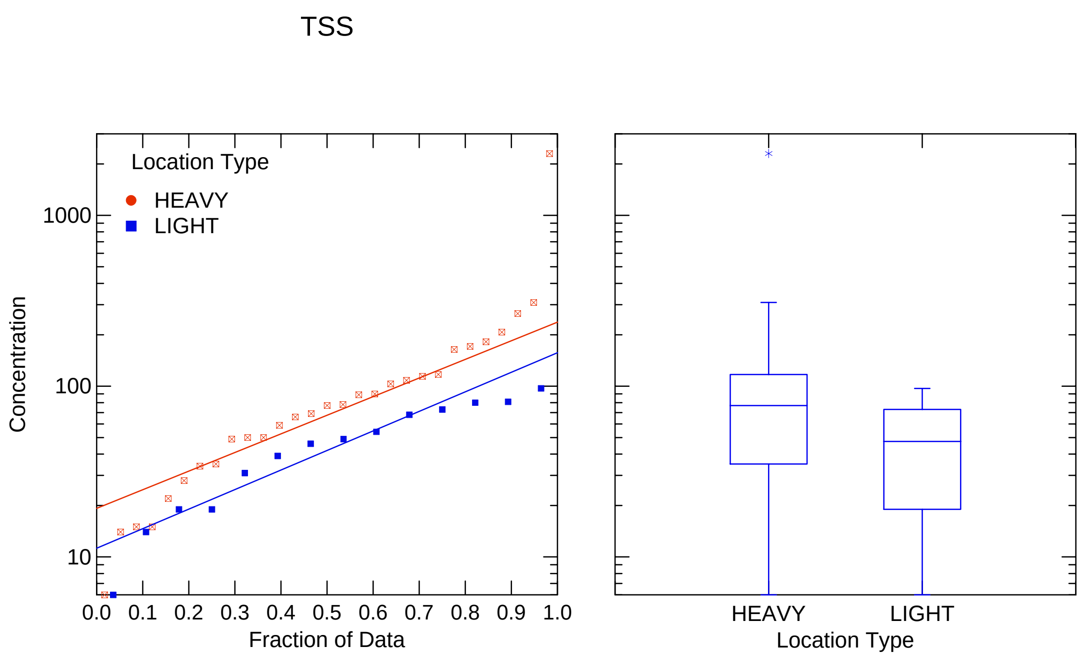
PCB-153, total



PCB-194, total

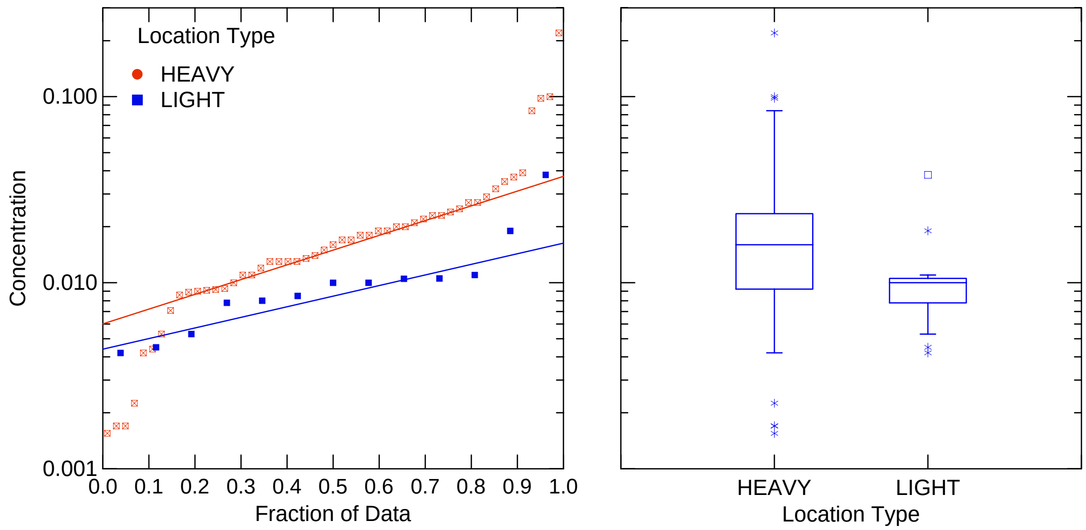



TOC
Location Type
HEAVY
LIGHT
Concentration
160
120
80
40
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
HEAVY
LIGHT
Location Type

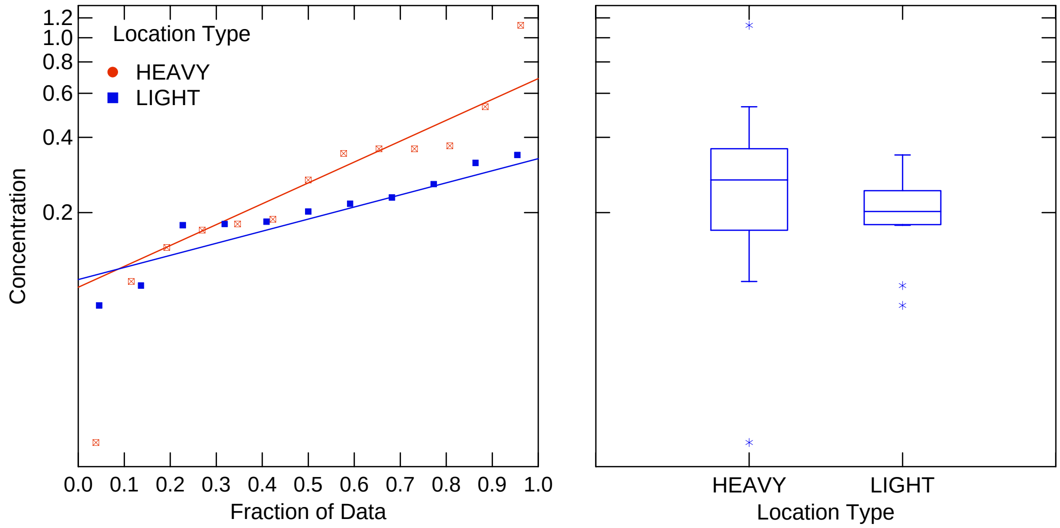

TSS
Location Type
HEAVY
LIGHT
Concentration
1000
100
10
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
Fraction of Data
HEAVY
LIGHT
Location Type

Reclassified Data Plots (Based on Item 4F Analysis)

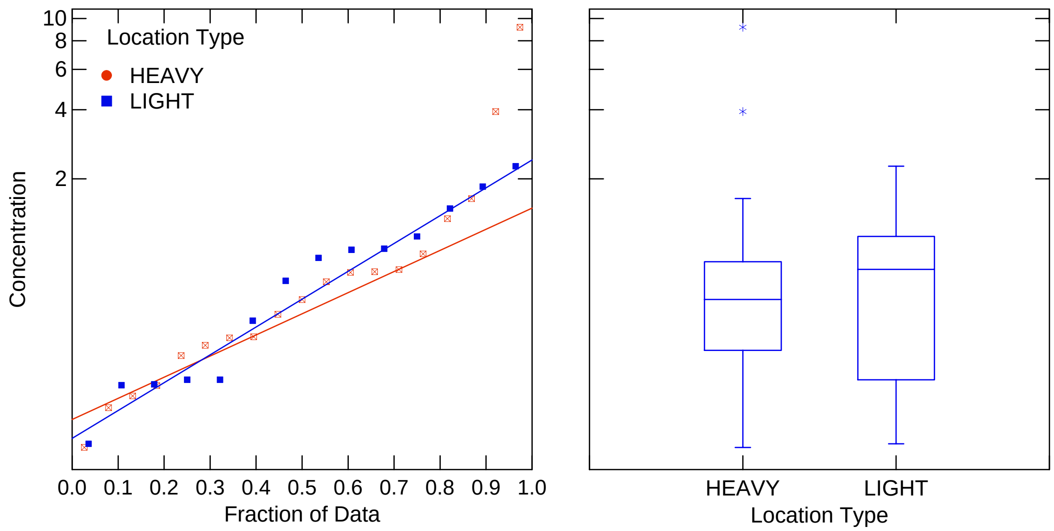
Acenaphthylene, Total



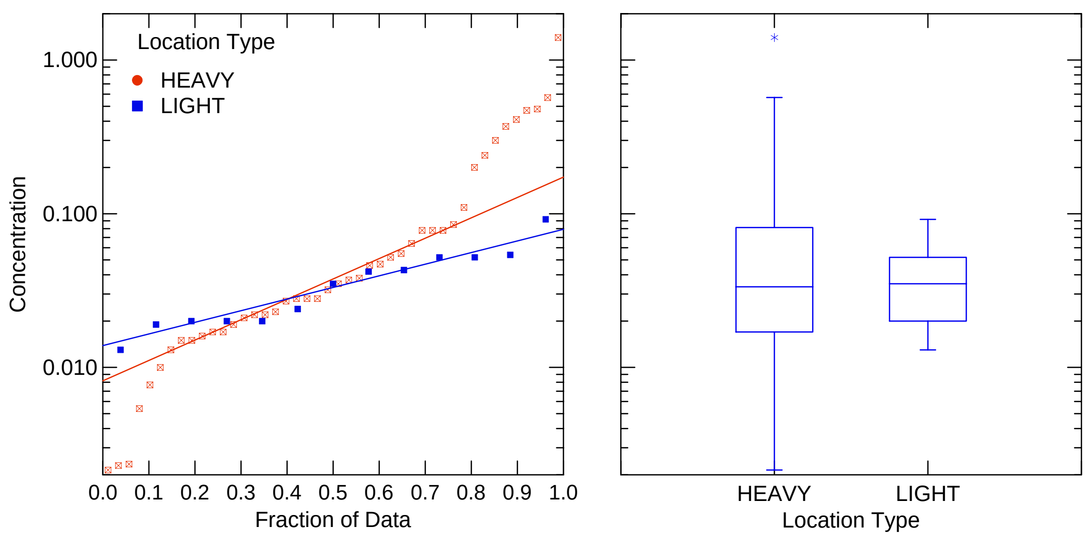
Arsenic, dissolved



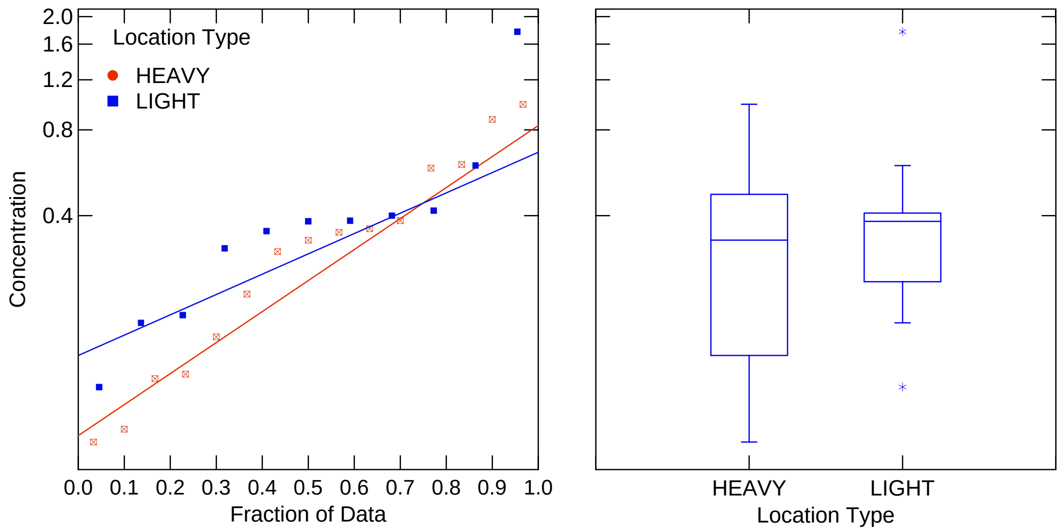
Arsenic, total



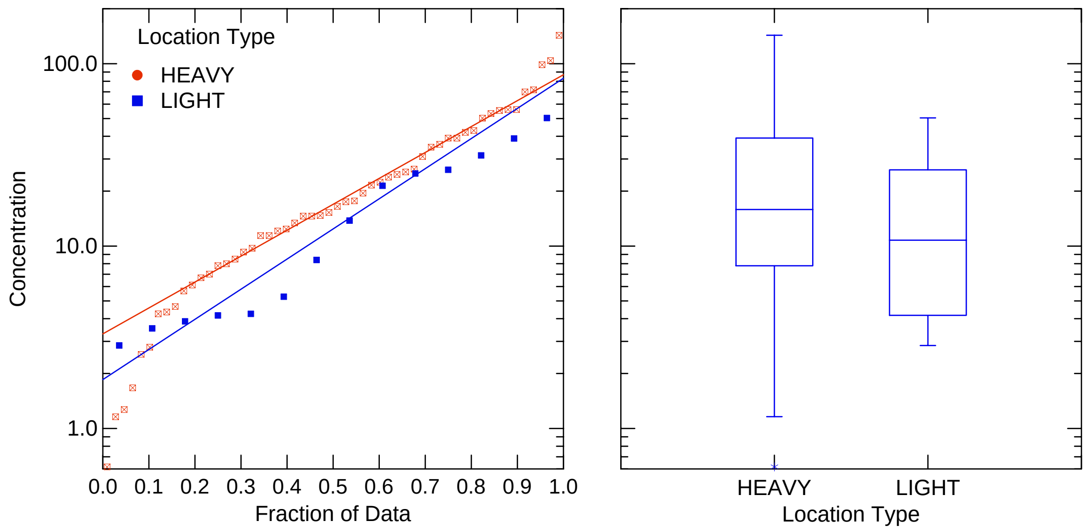
Benzo(a)pyrene, total



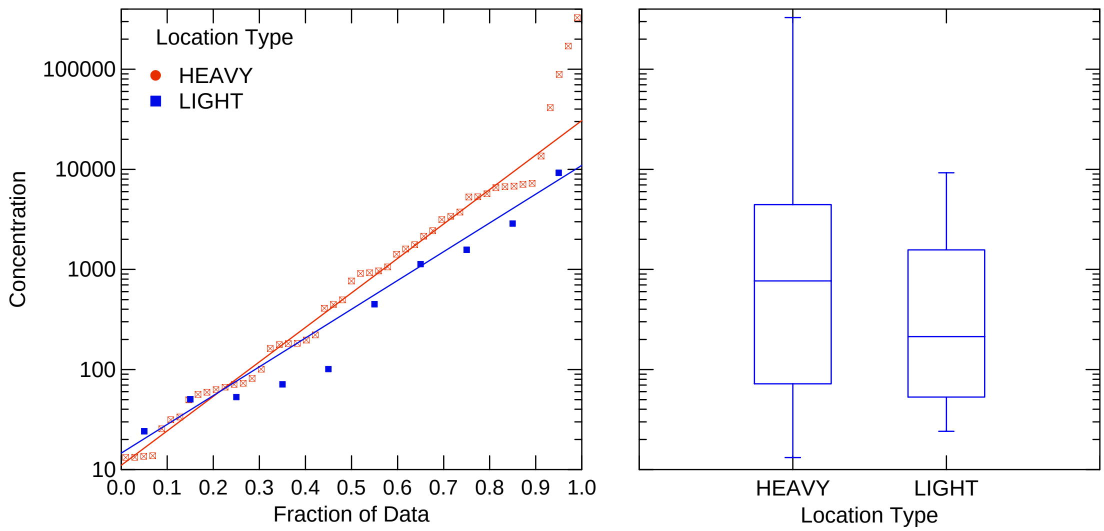
Lead, dissolved



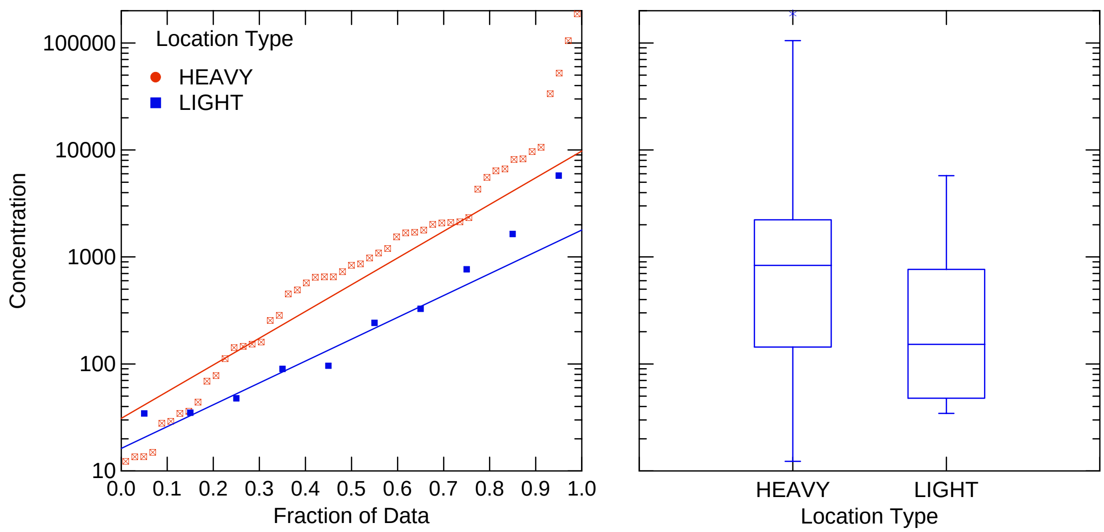
Lead, total



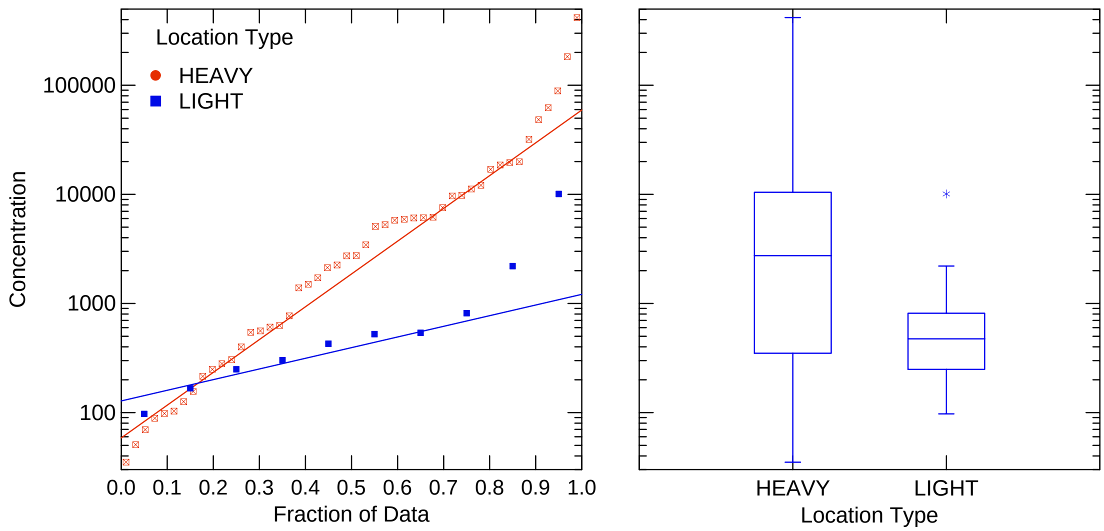
PCB-018, total



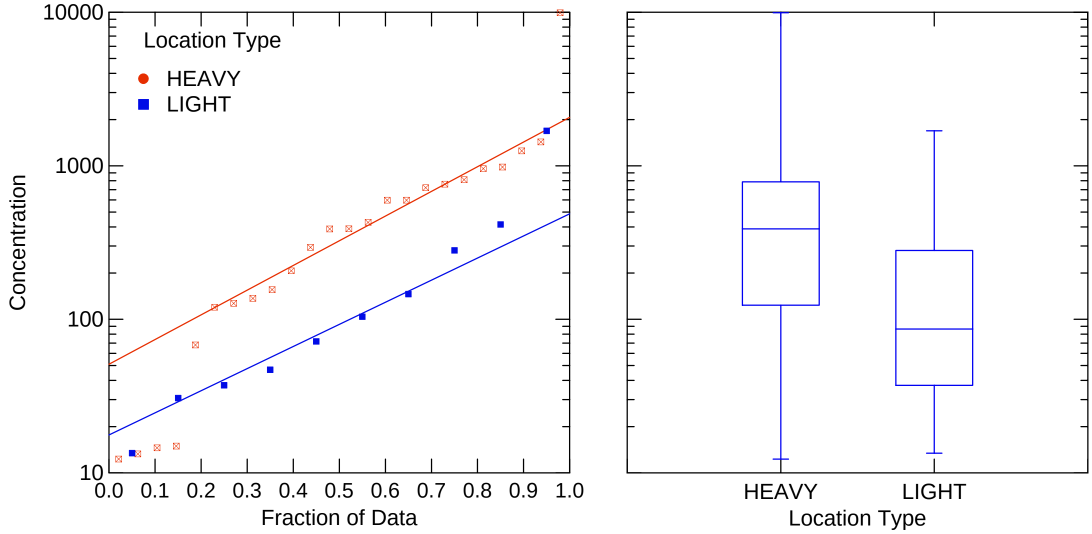
PCB-066, total



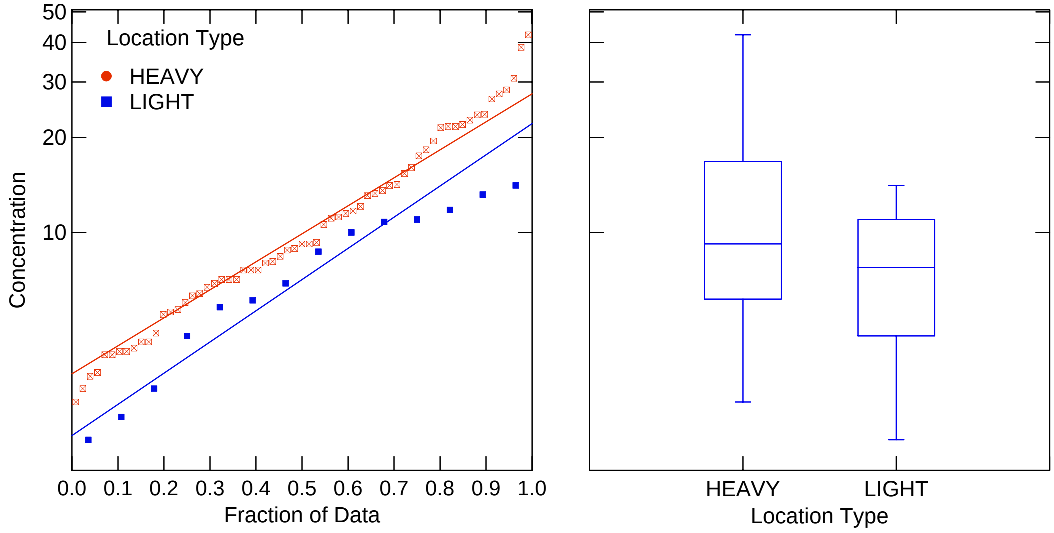
PCB-153, total



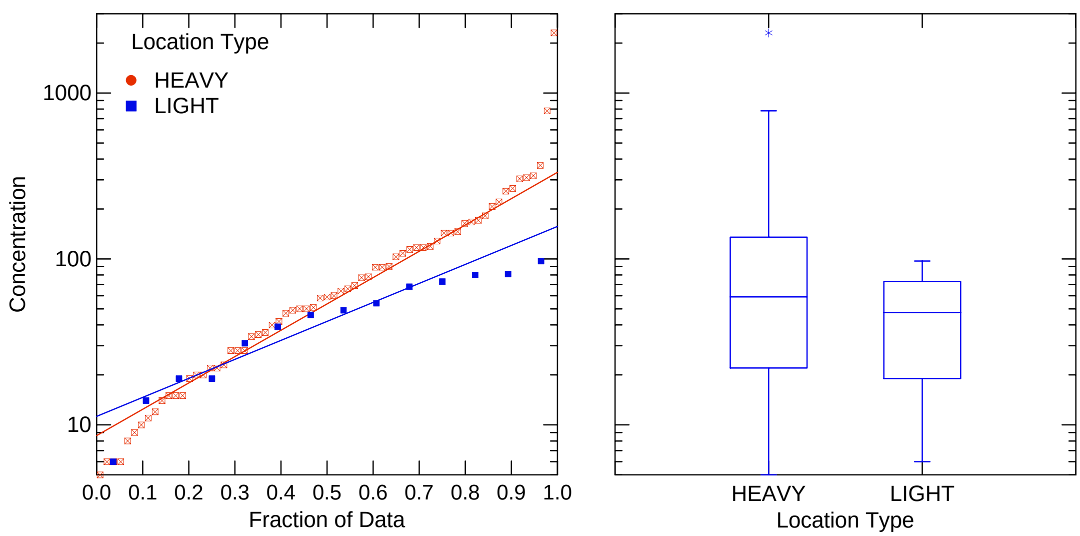
PCB-194, total



TOC


Location Type
HEAVY
LIGHT
Concentration
50
40
30
20
10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Fraction of Data
HEAVY
LIGHT
Location Type

TSS


Location Type
HEAVY
LIGHT
Concentration
1000
100
10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Fraction of Data
HEAVY
LIGHT
Location Type

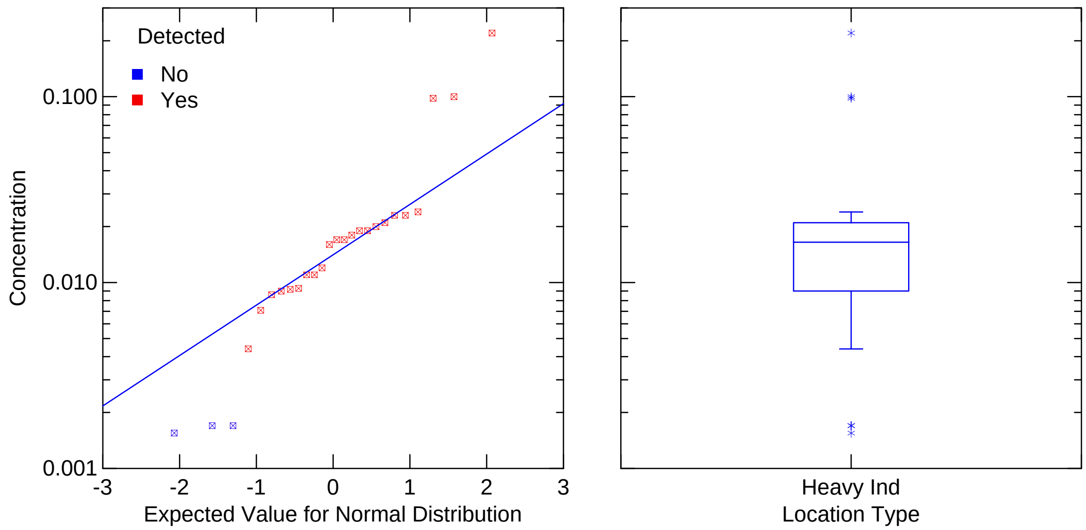
Appendix A-5

Outlier Analysis and Stormwater Variable Association

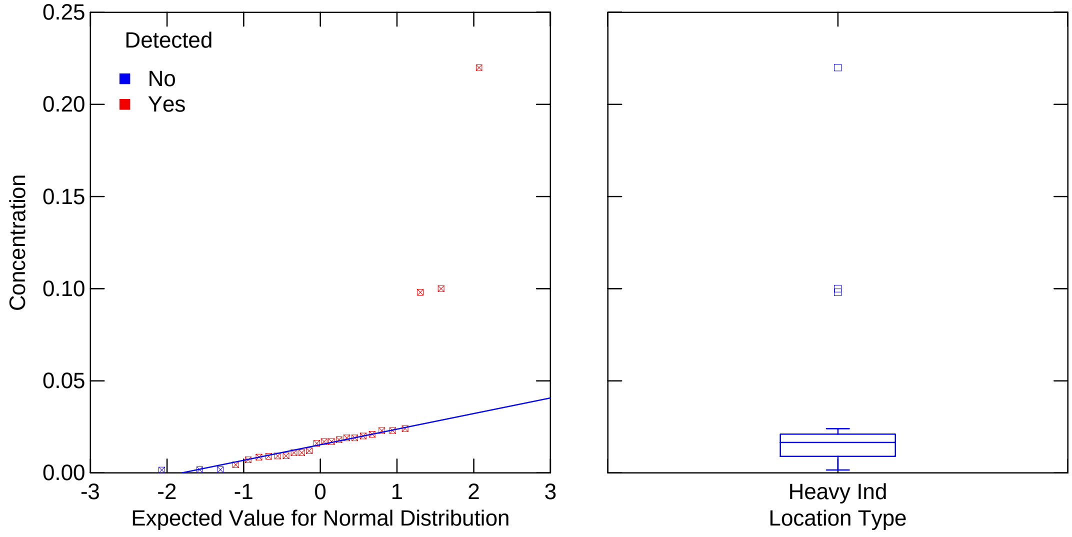
Outlier Analysis

ORIGINAL DATA - UNIQUE HEAVY INDUSTRIAL LOCATIONS

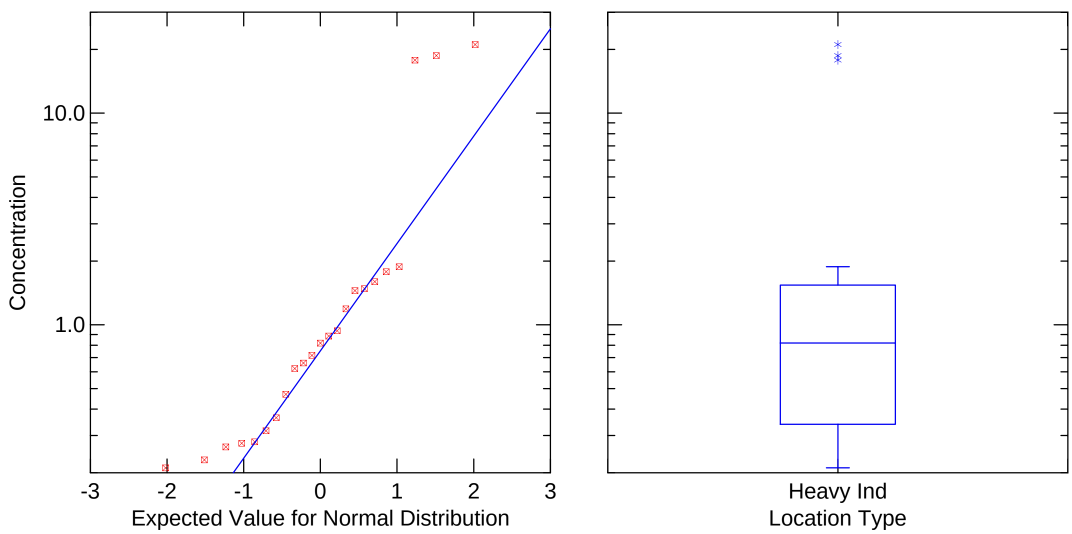
Acenaphythlene, Total



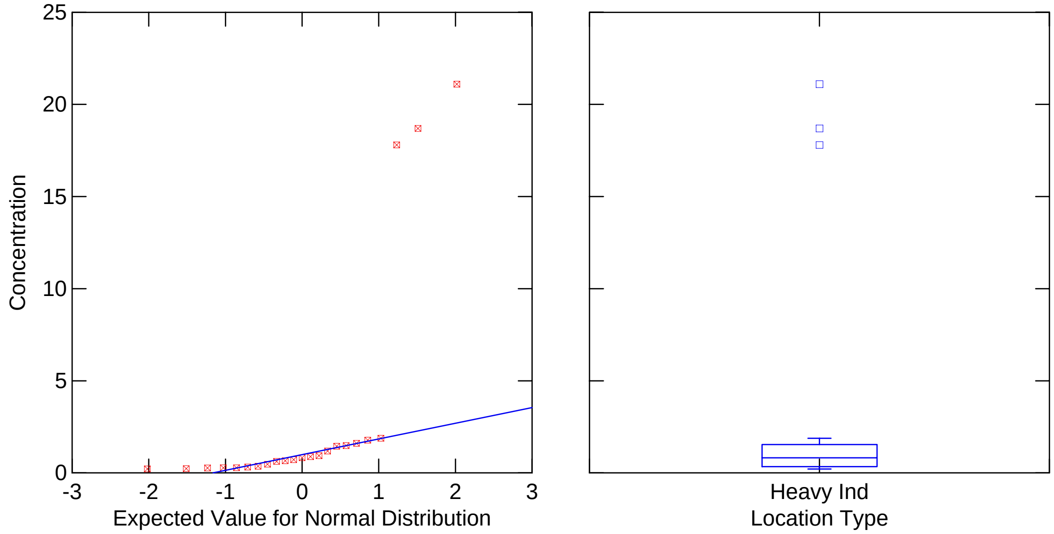
Acenaphthylene, Total



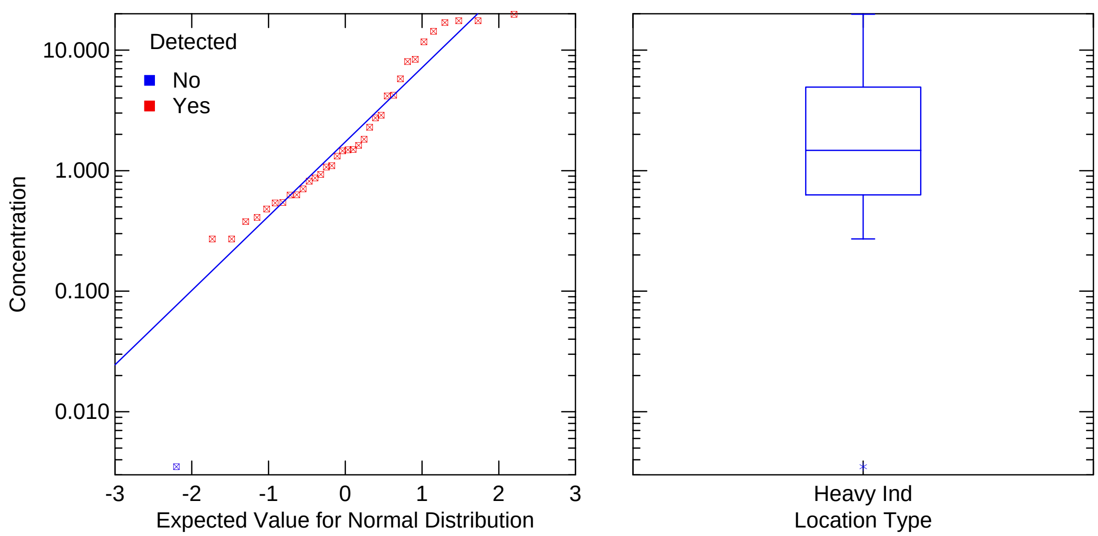
Arsenic, dissolved



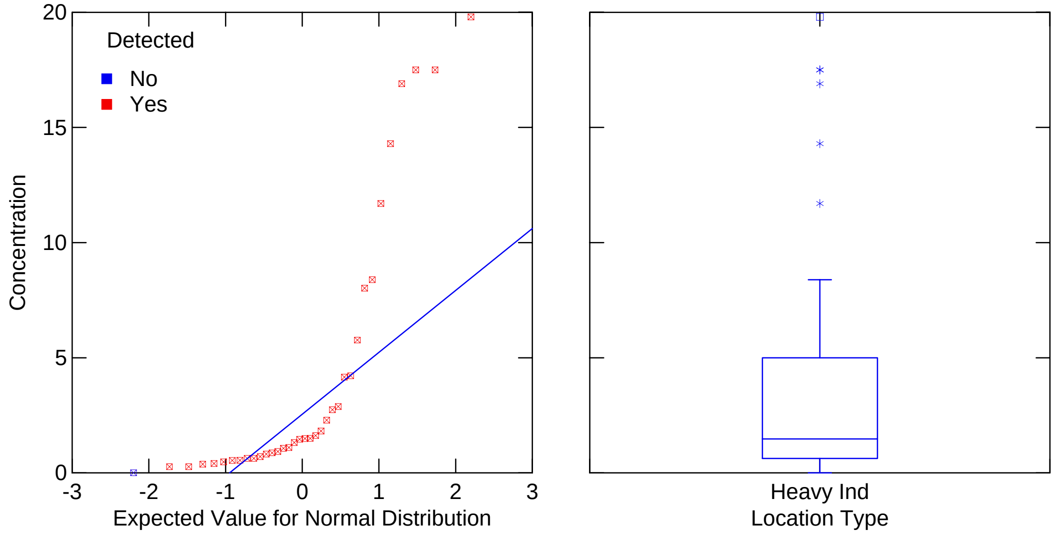
Arsenic, dissolved



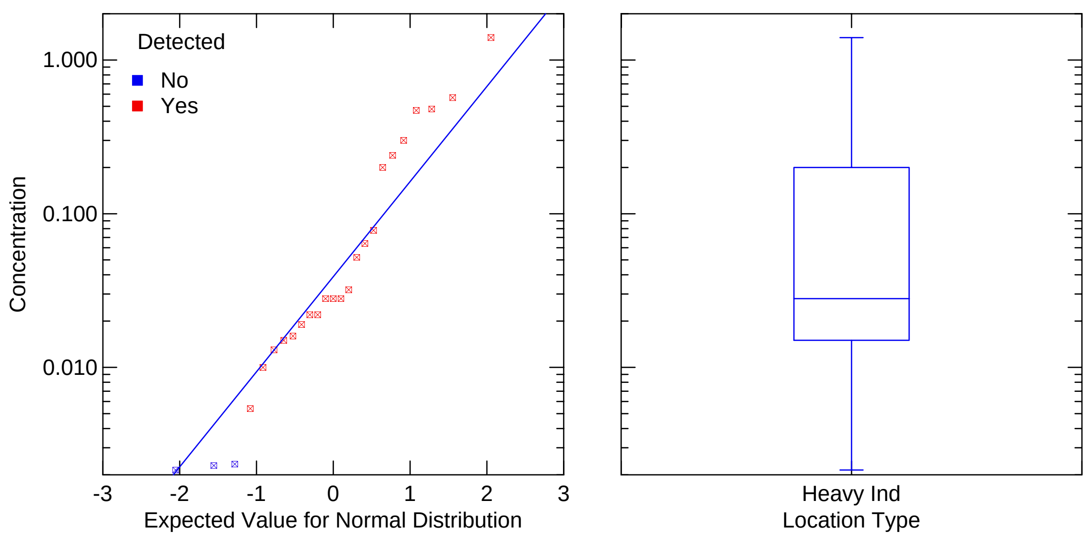
Arsenic, total



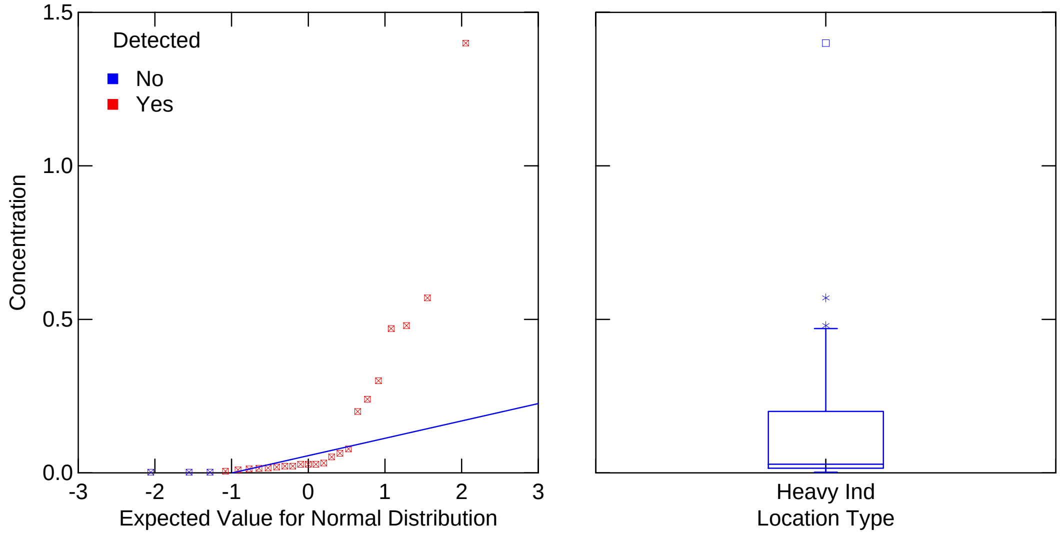
Arsenic, total



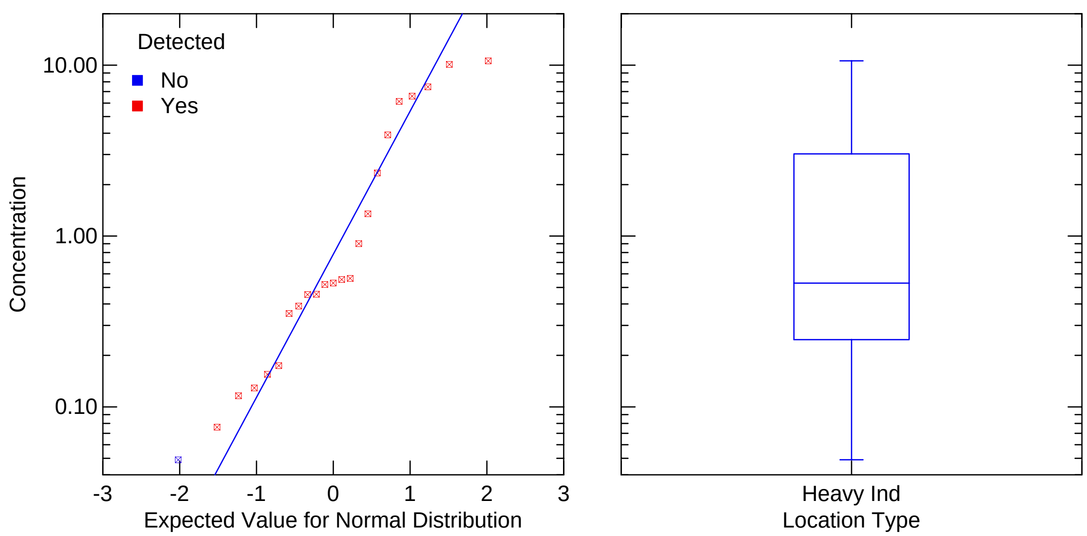
Benzo(a)pyrene, total



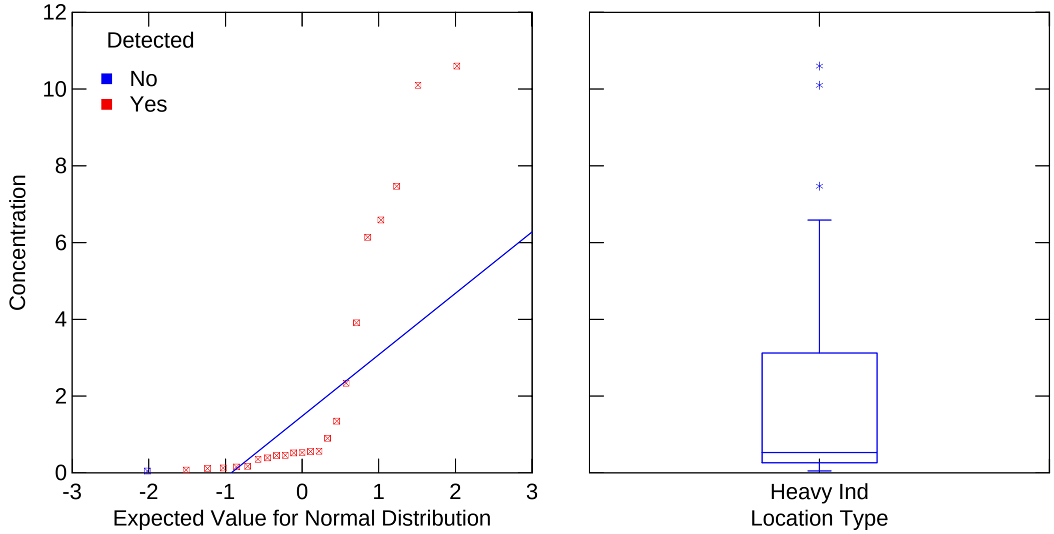
Benzo(a)pyrene, total



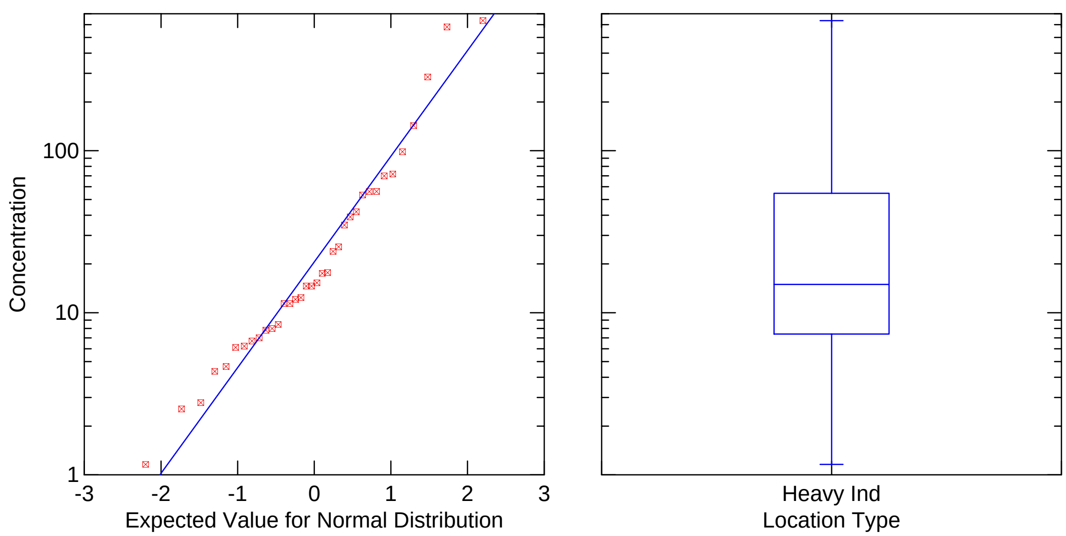
Lead, dissolved



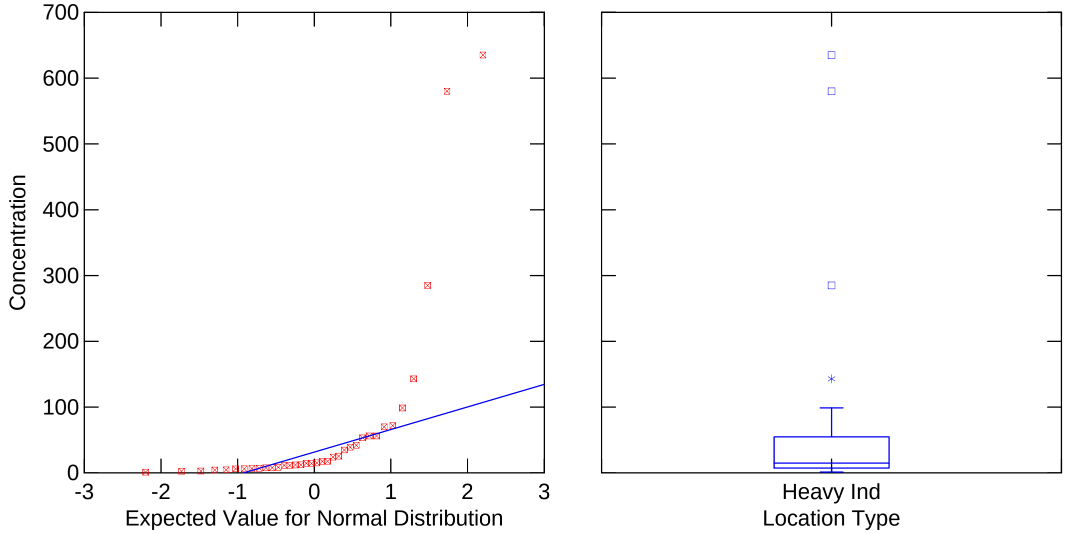
Lead, dissolved



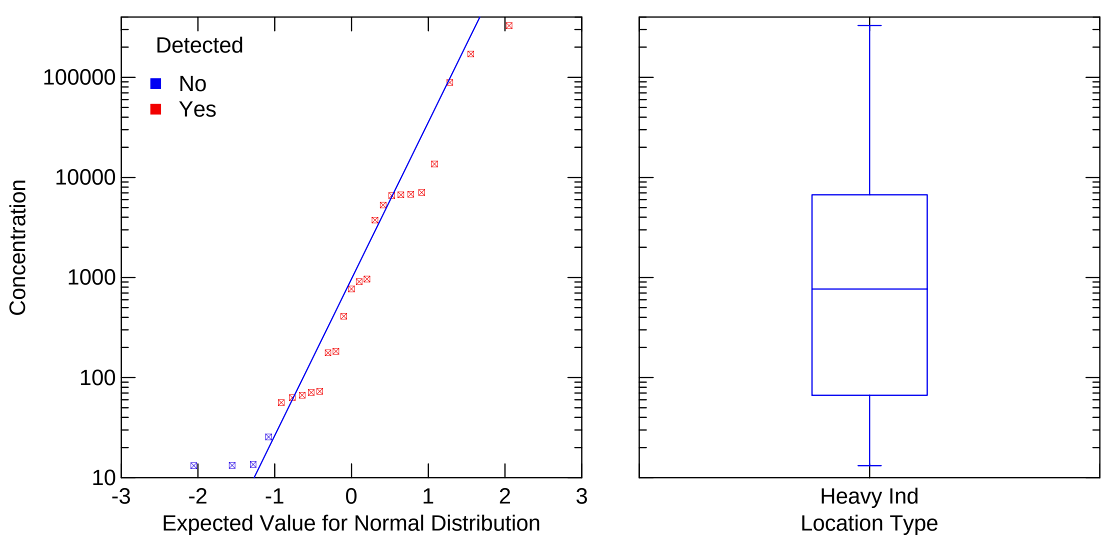
Lead, total



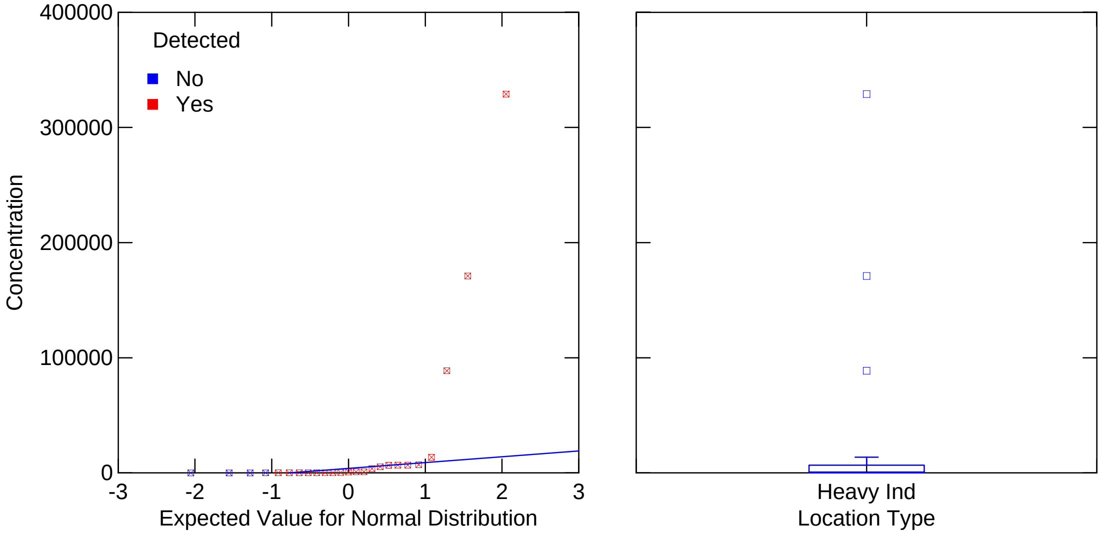
Lead, total



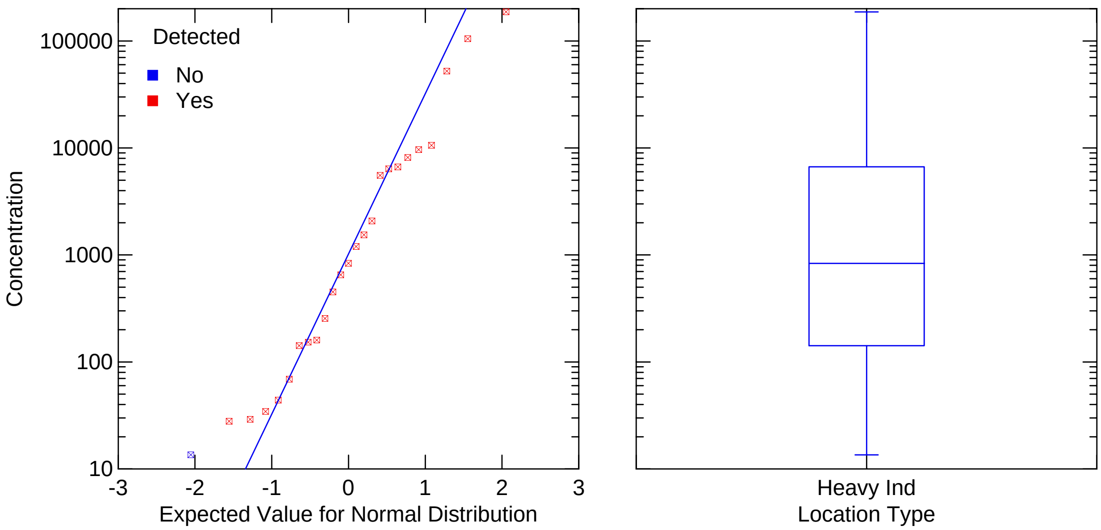
PCB-018, total

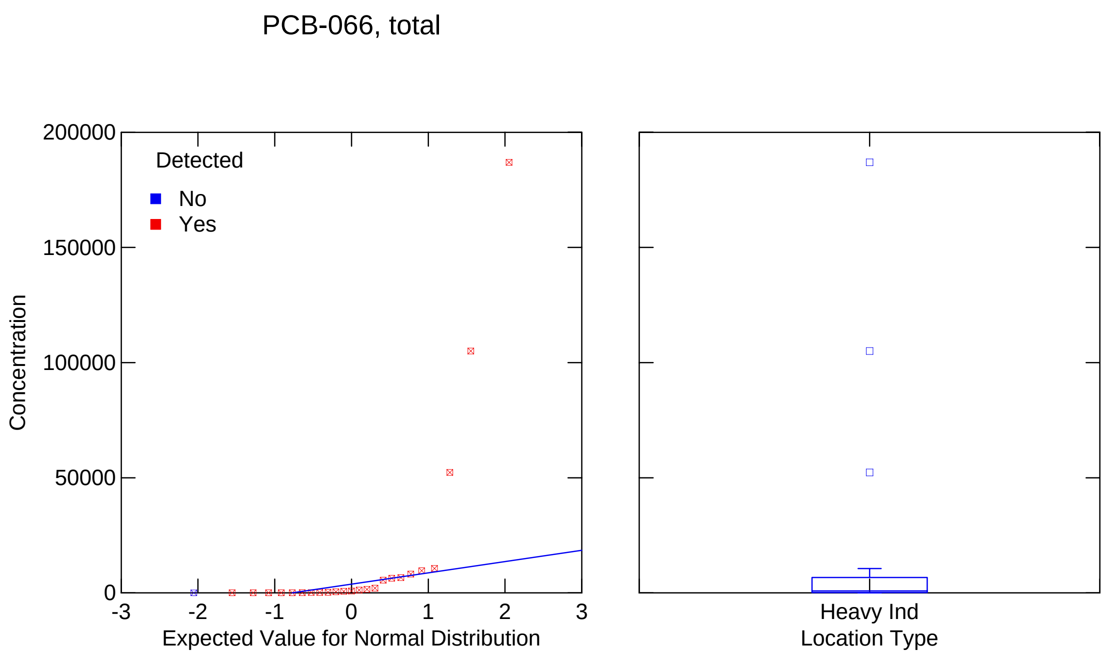


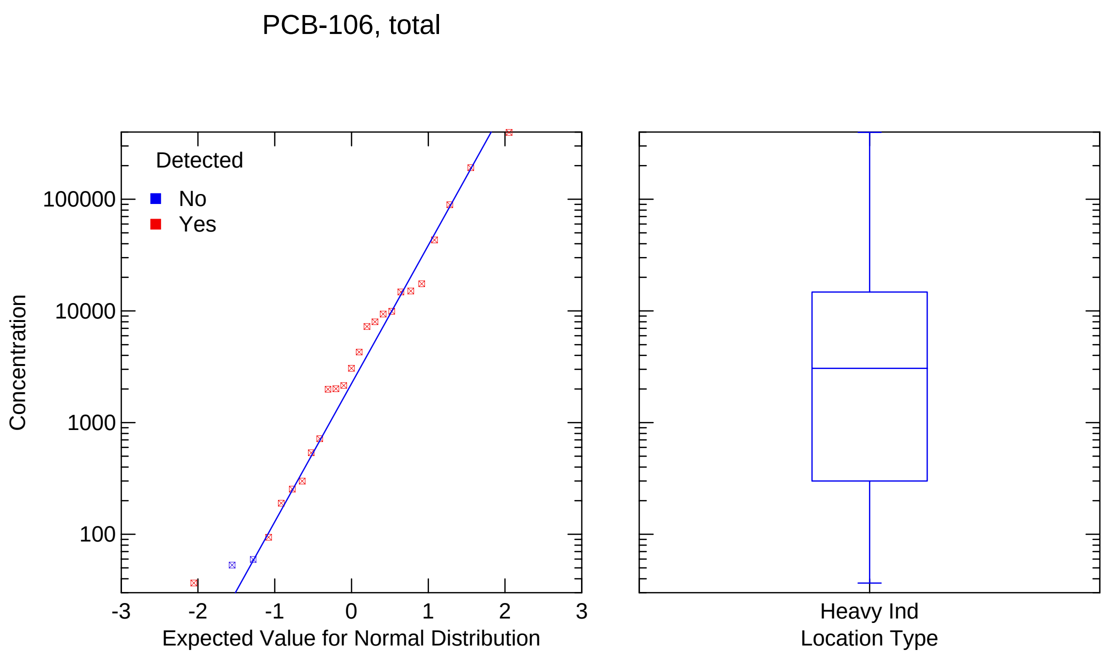
PCB-018, total



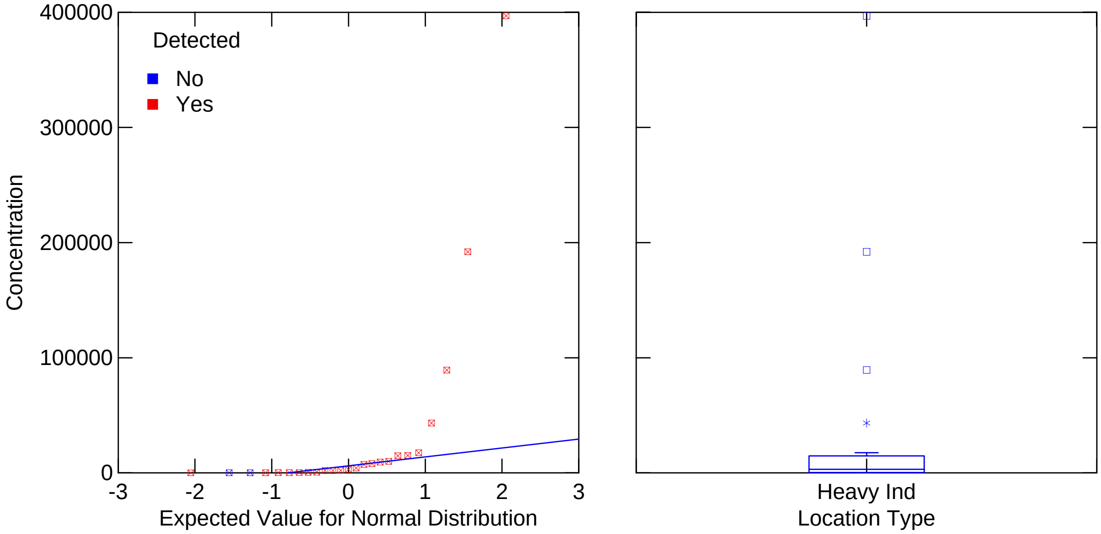
PCB-066, total



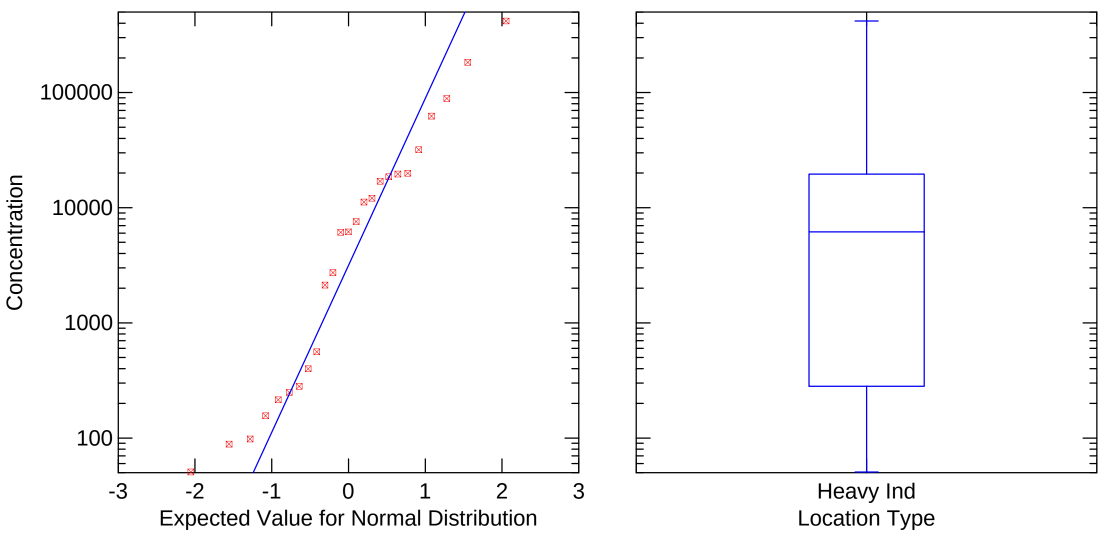

PCB-066, total
Detected
No
Yes
Concentration
200000
150000
100000
50000
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type


PCB-106, total
Detected
No
Yes
Concentration
100000
10000
1000
100
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

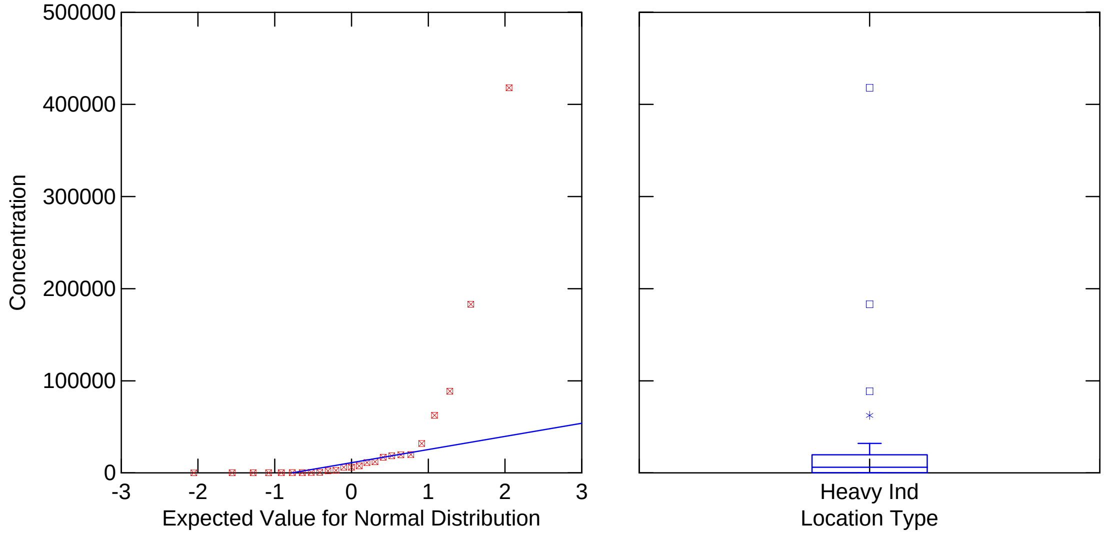
PCB-106, total



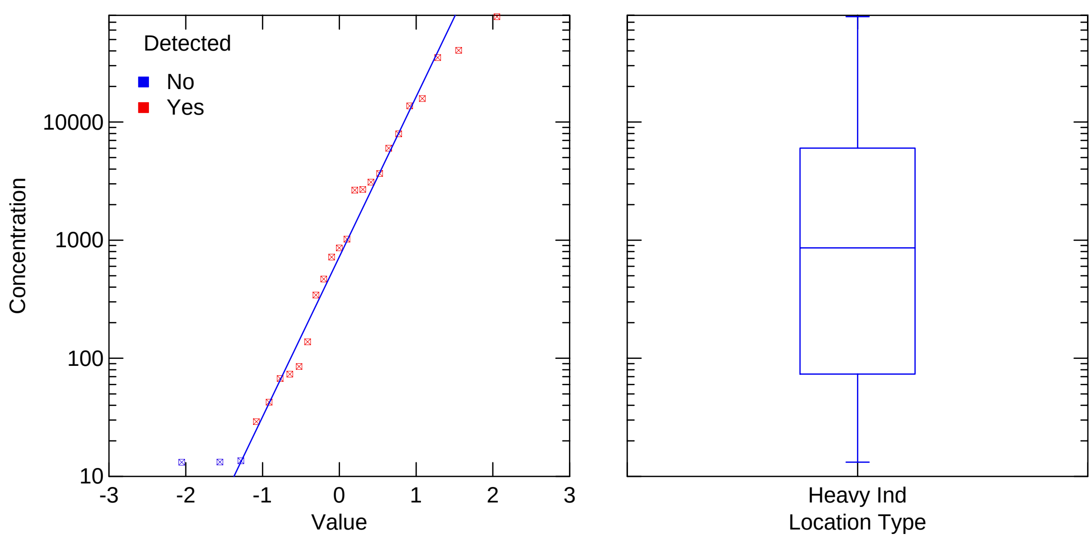
PCB-153, total



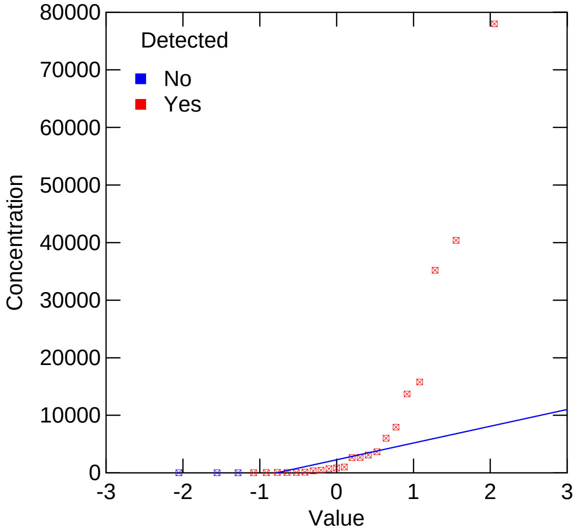
PCB-153, total

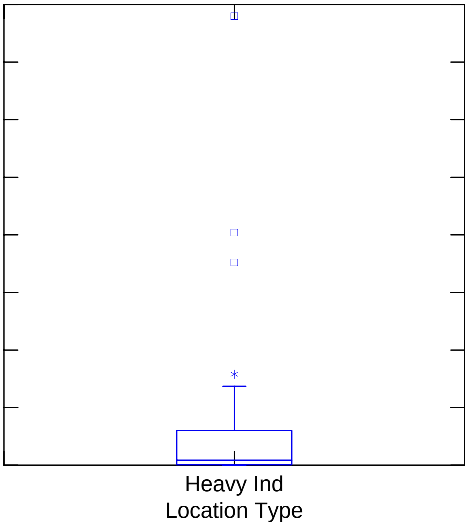


PCB-194, total

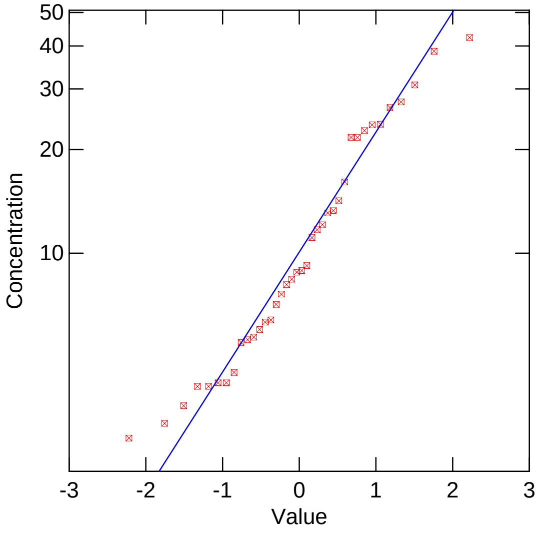


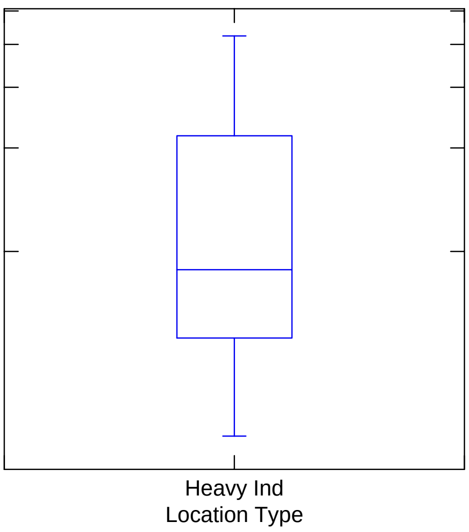
PCB-194, total

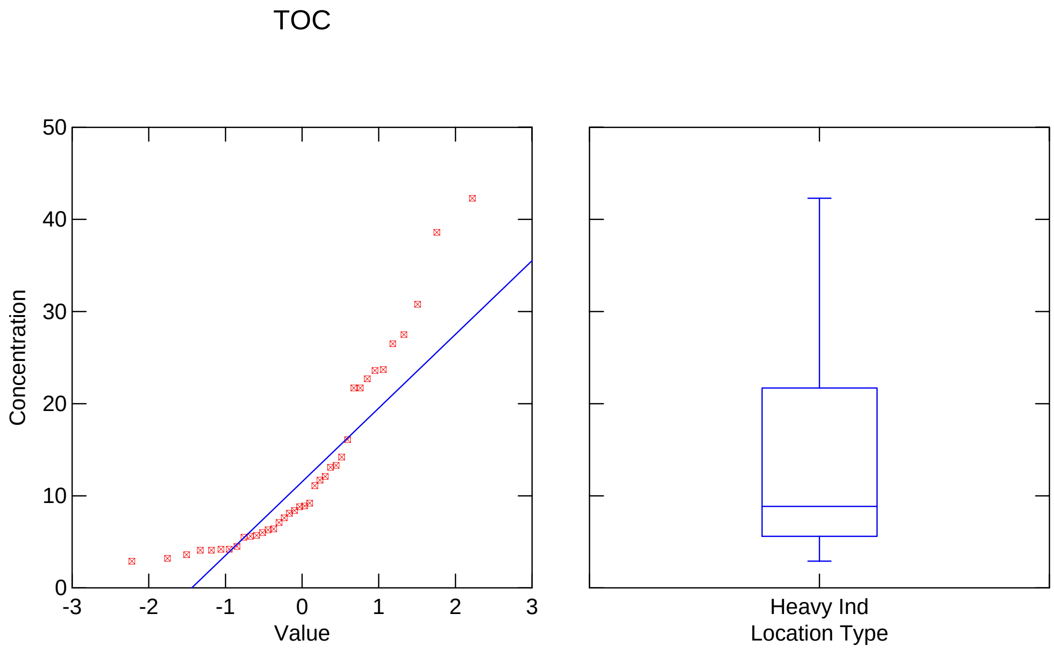


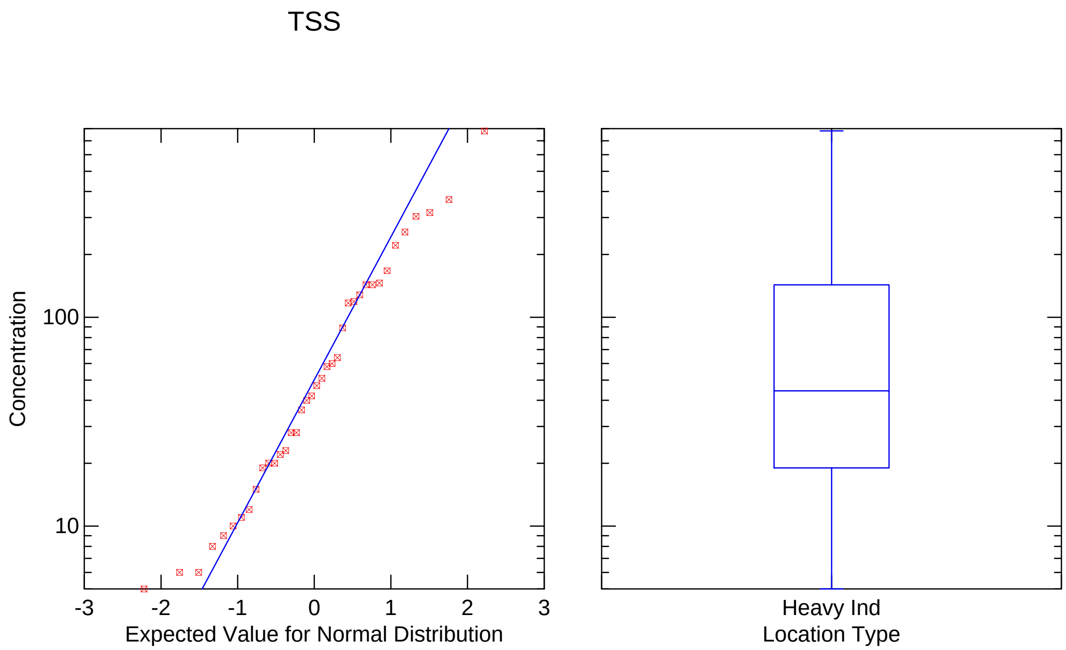


TOC

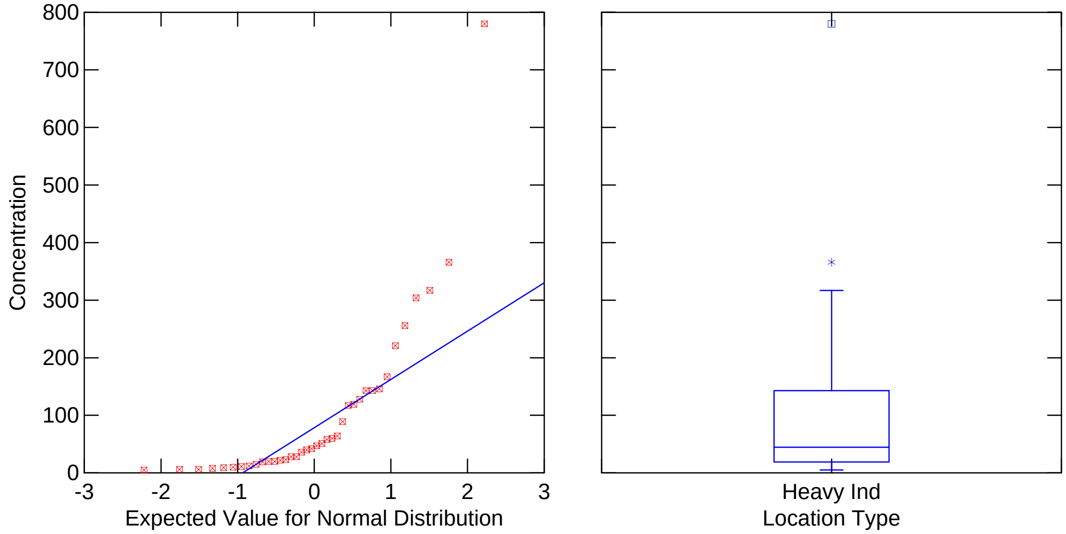




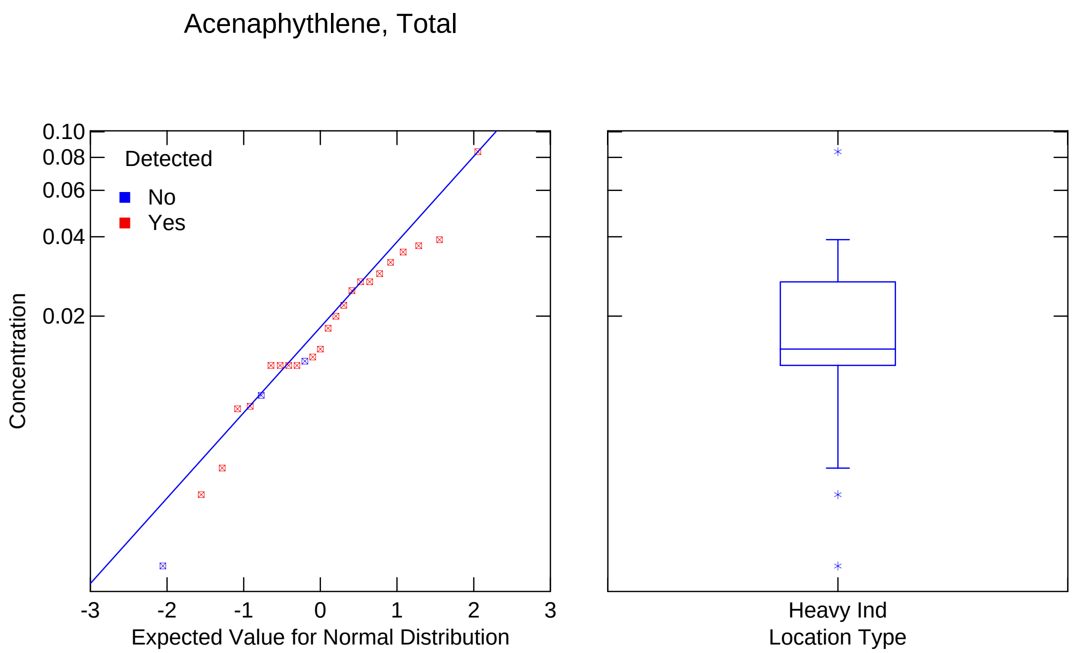

TOC
Concentration
0
10
20
30
40
50
-3
-2
-1
0
1
2
3
Value
Heavy Ind
Location Type

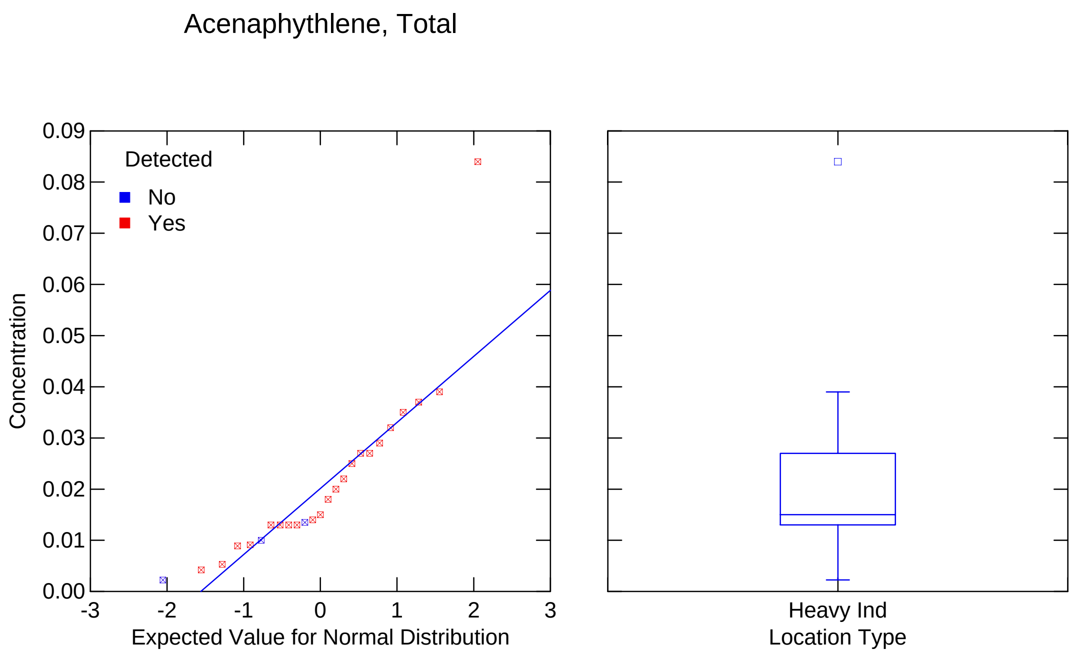

TSS
Concentration
10
100
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

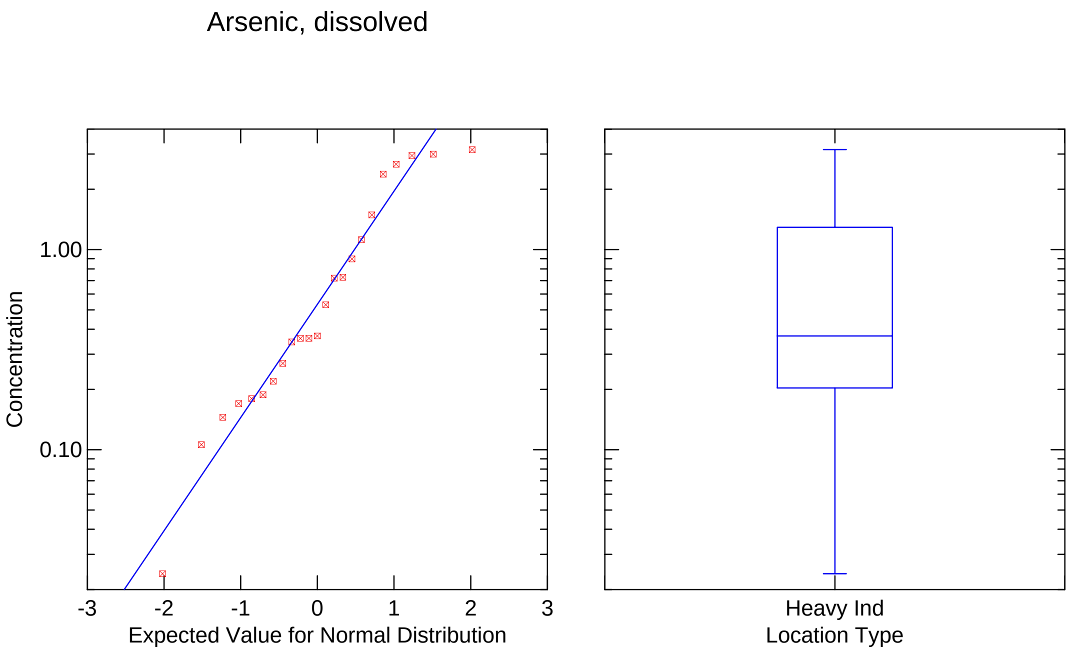
TSS

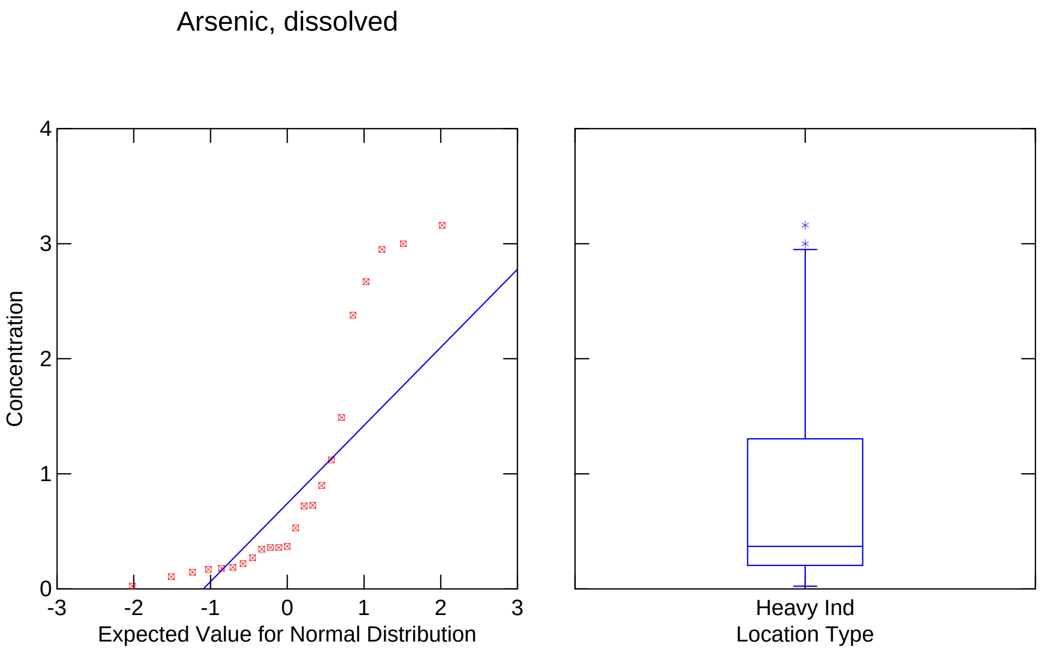

Concentration
800
700
600
500
400
300
200
100
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

ORIGINAL DATA - REPRESENTATIVE HEAVY INDUSTRIAL LOCATIONS

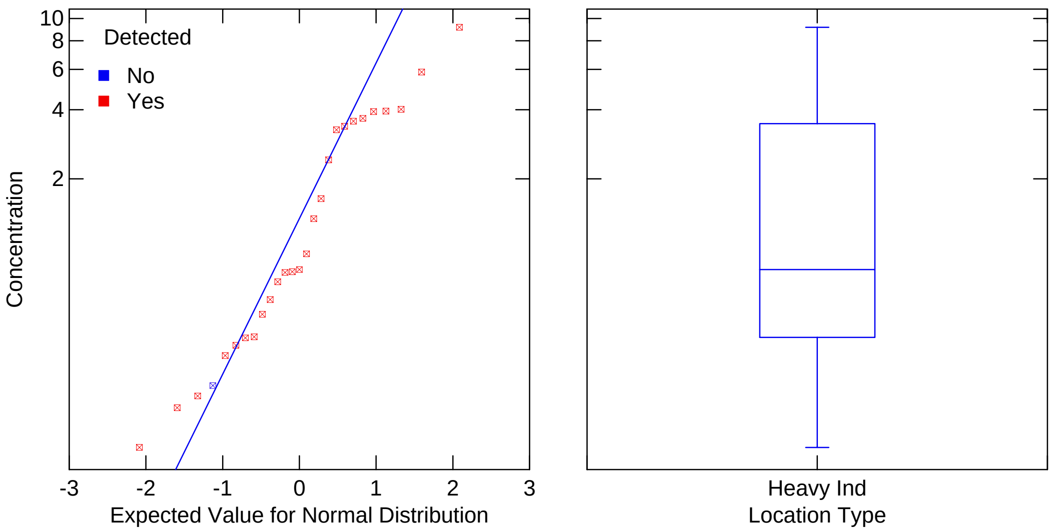




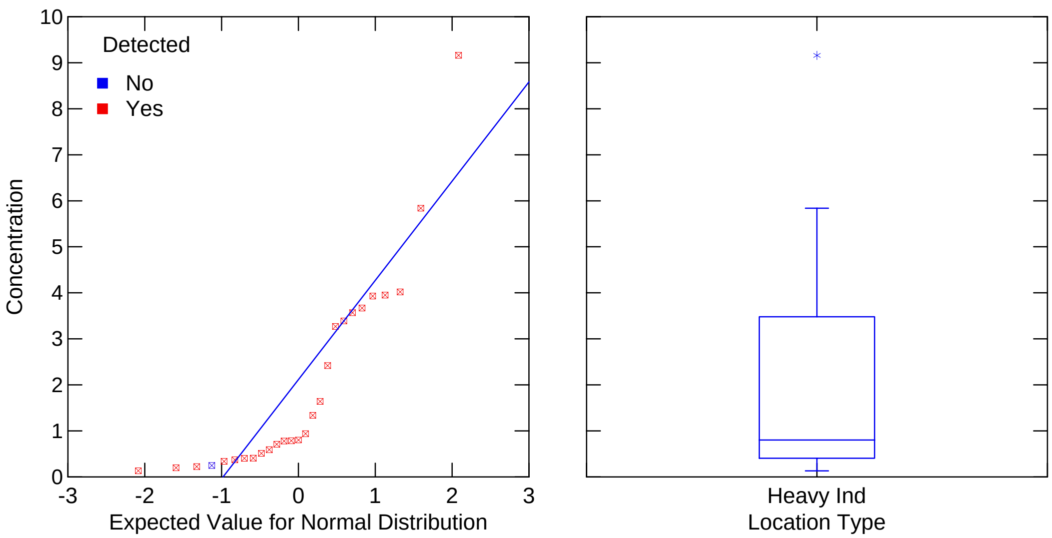

Arsenic, dissolved
Concentration
1.00
0.10
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

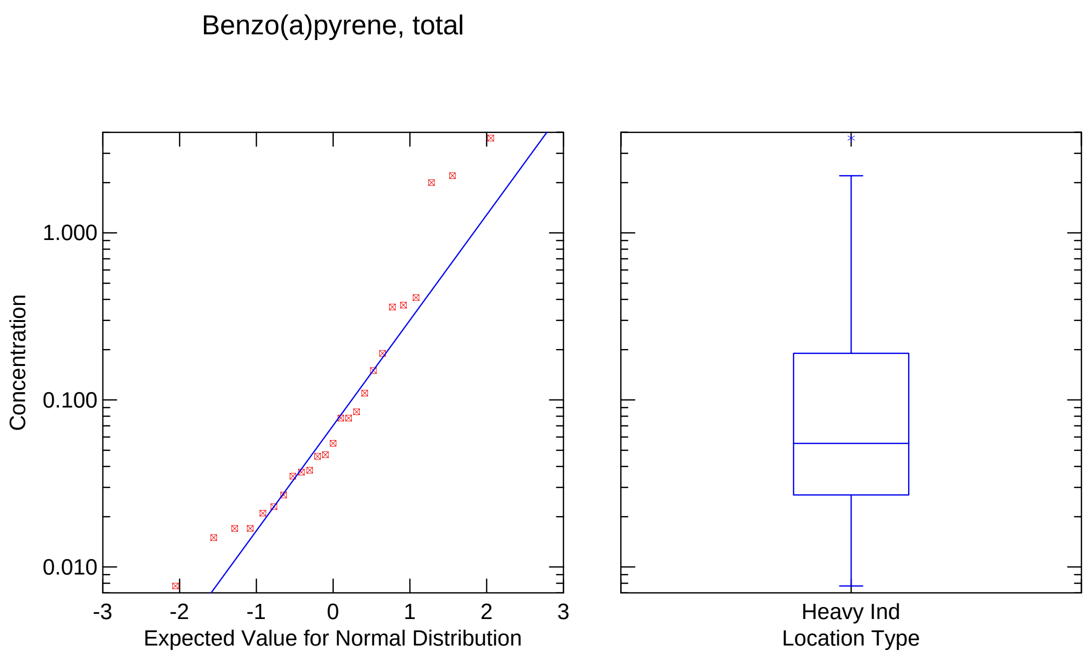

Arsenic, dissolved
Concentration
4
3
2
1
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

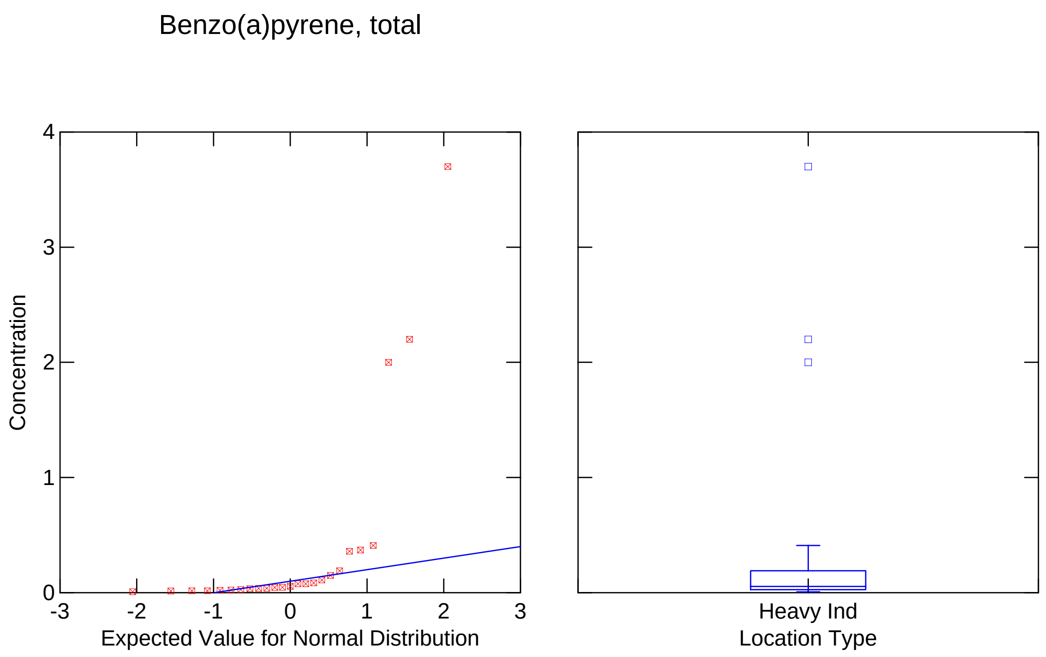
Arsenic, total



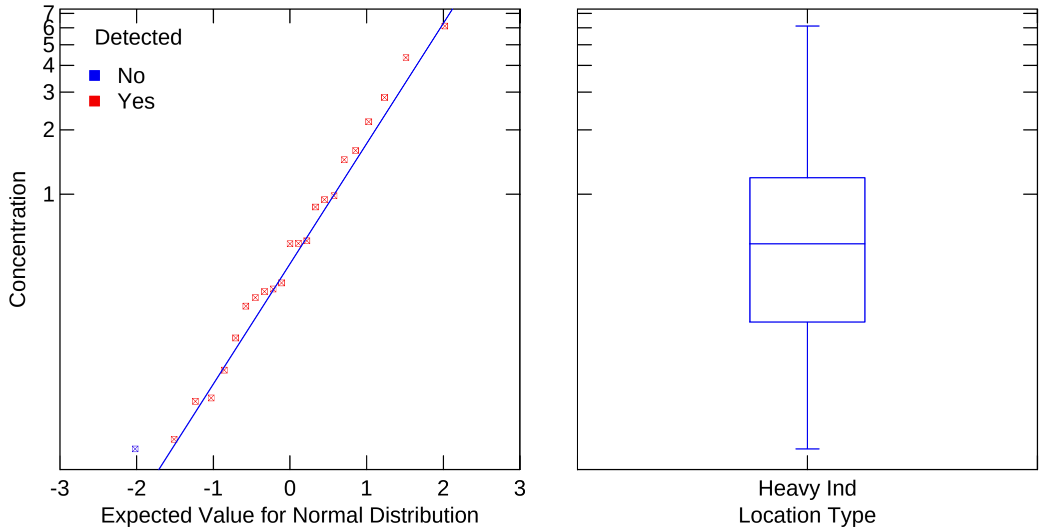
Arsenic, total



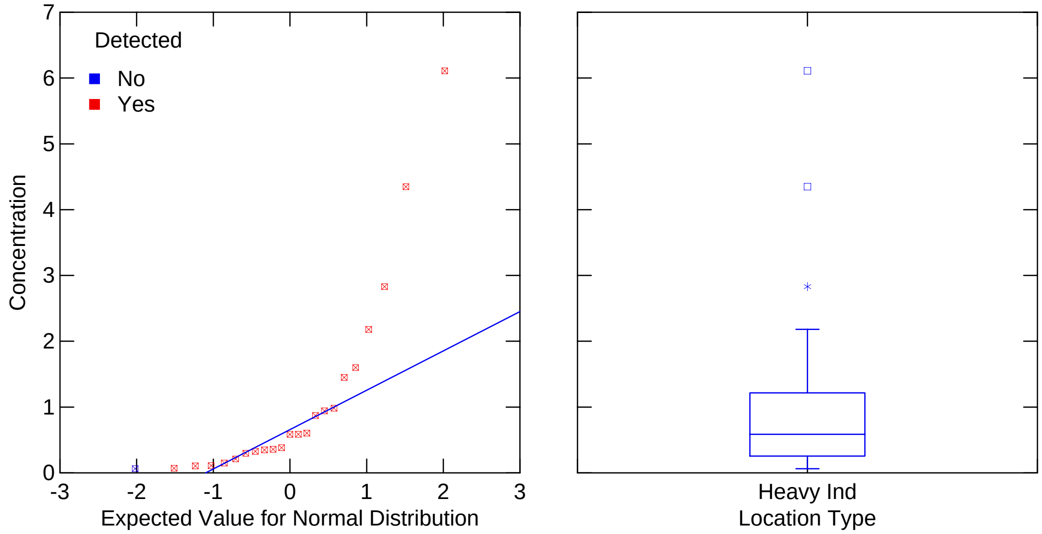

Benzo(a)pyrene, total
Concentration
1.000
0.100
0.010
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

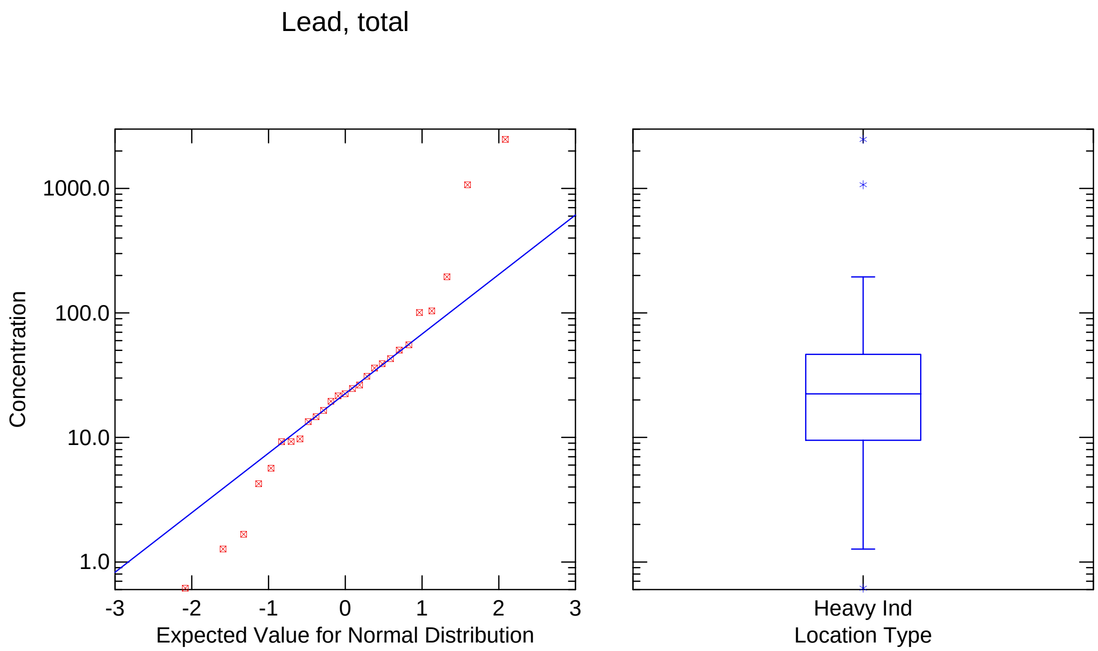

Benzo(a)pyrene, total
Concentration
4
3
2
1
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

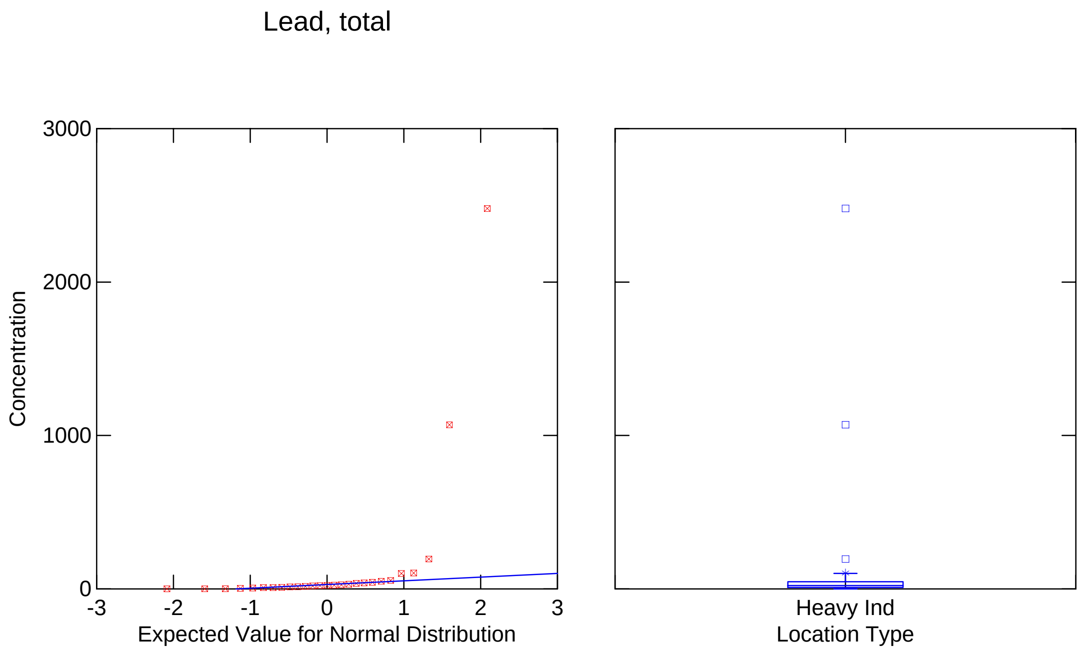
Lead, dissolved



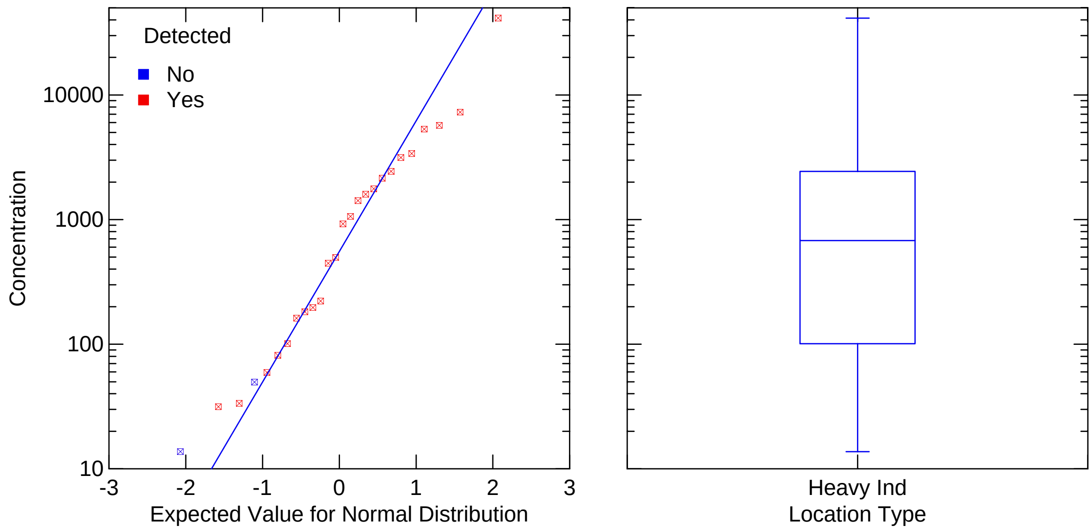
Lead, dissolved



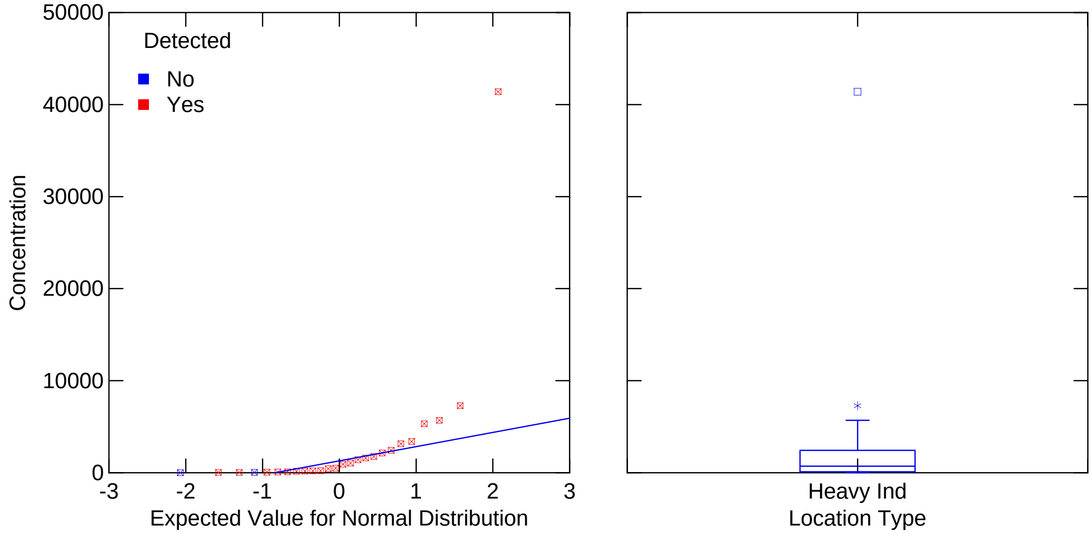

Lead, total
Concentration
1000.0
100.0
10.0
1.0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type


Lead, total
Concentration
3000
2000
1000
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

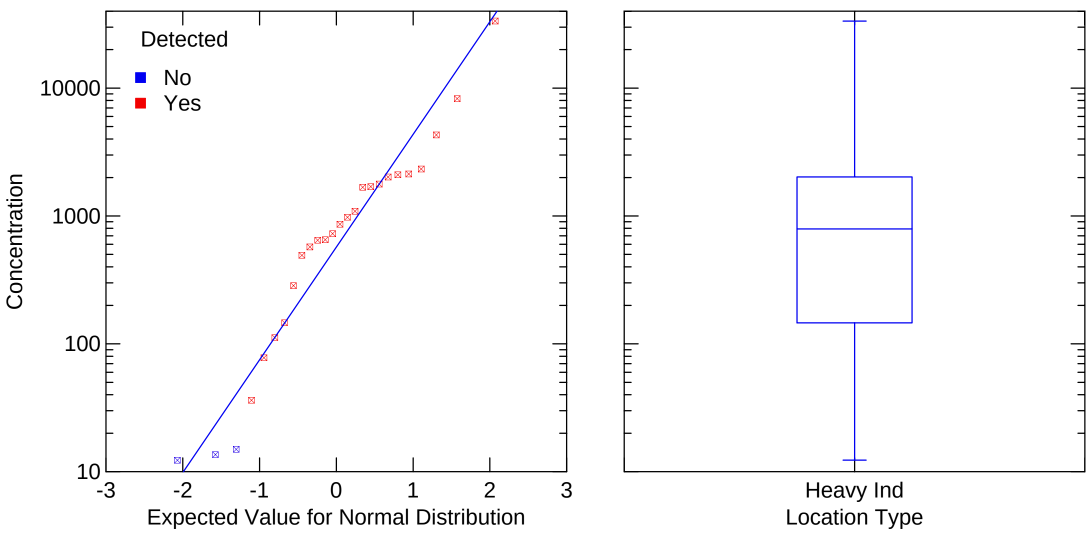
PCB-018, total



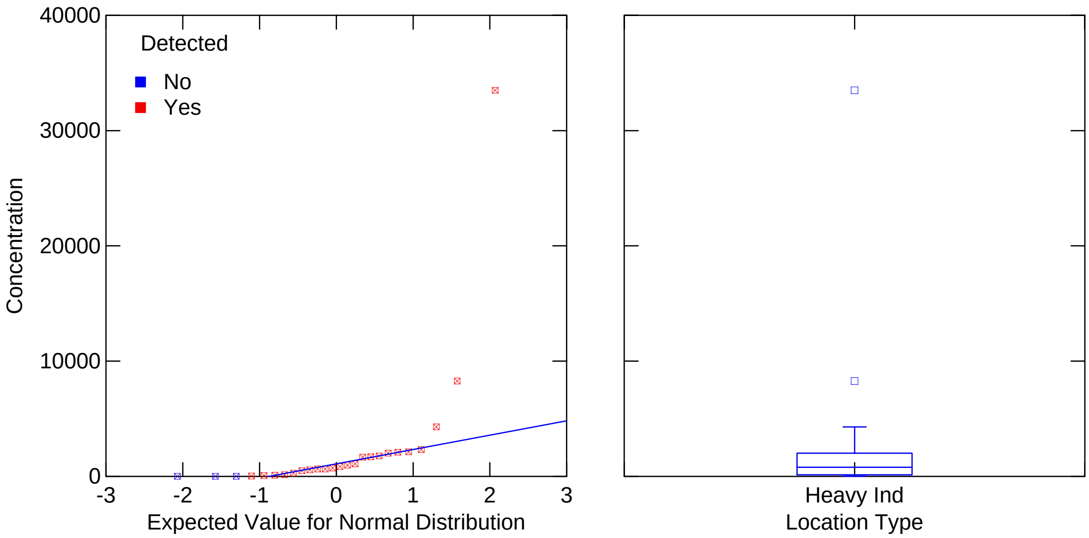
PCB-018, total



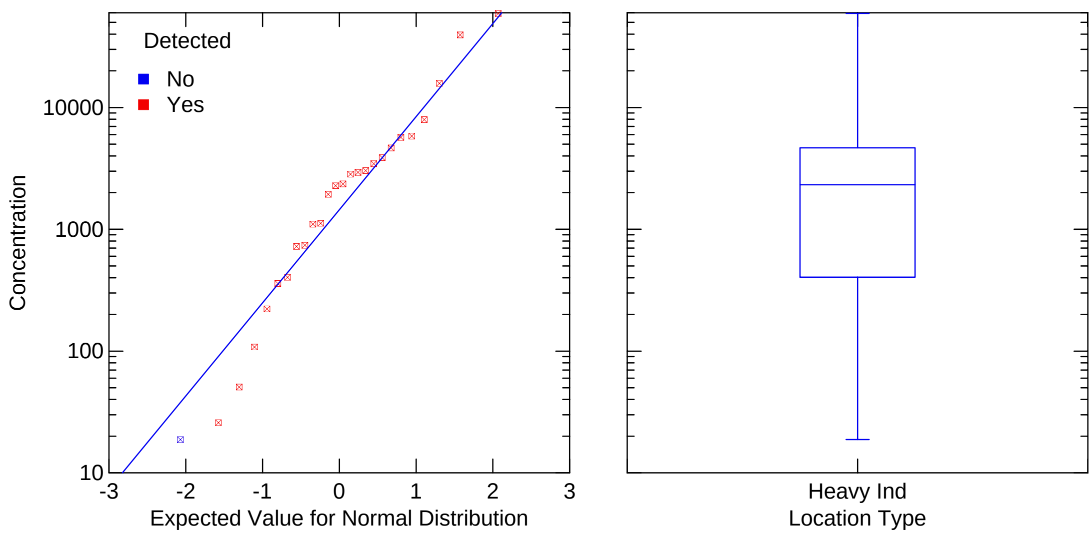
PCB-066, total



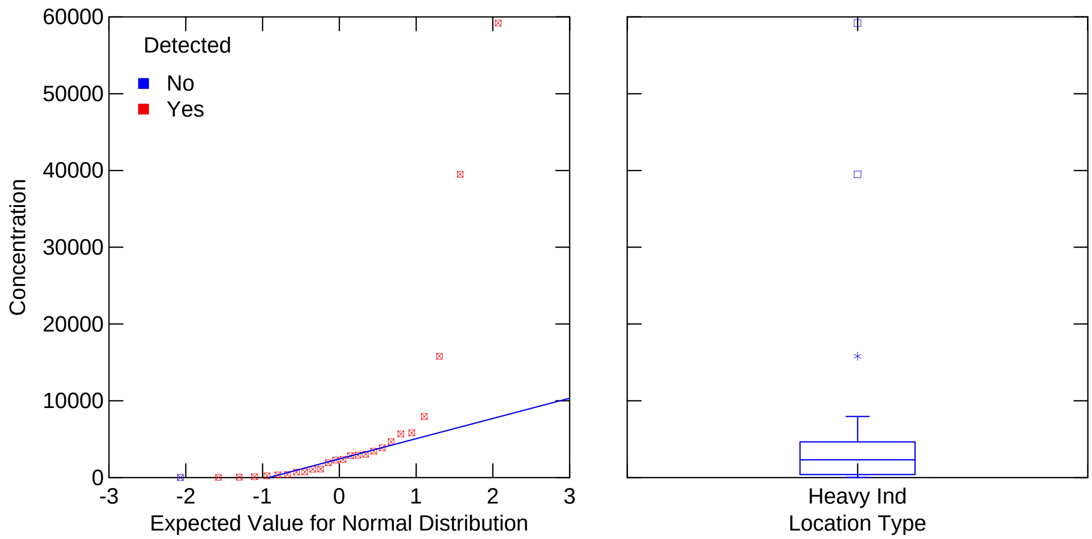
PCB-066, total

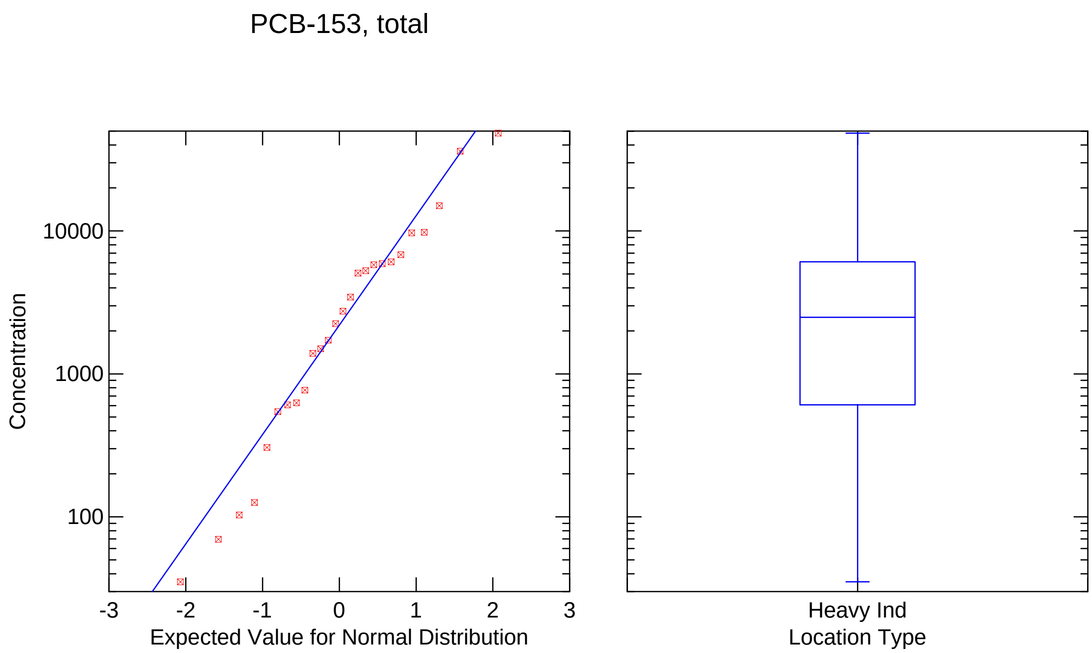


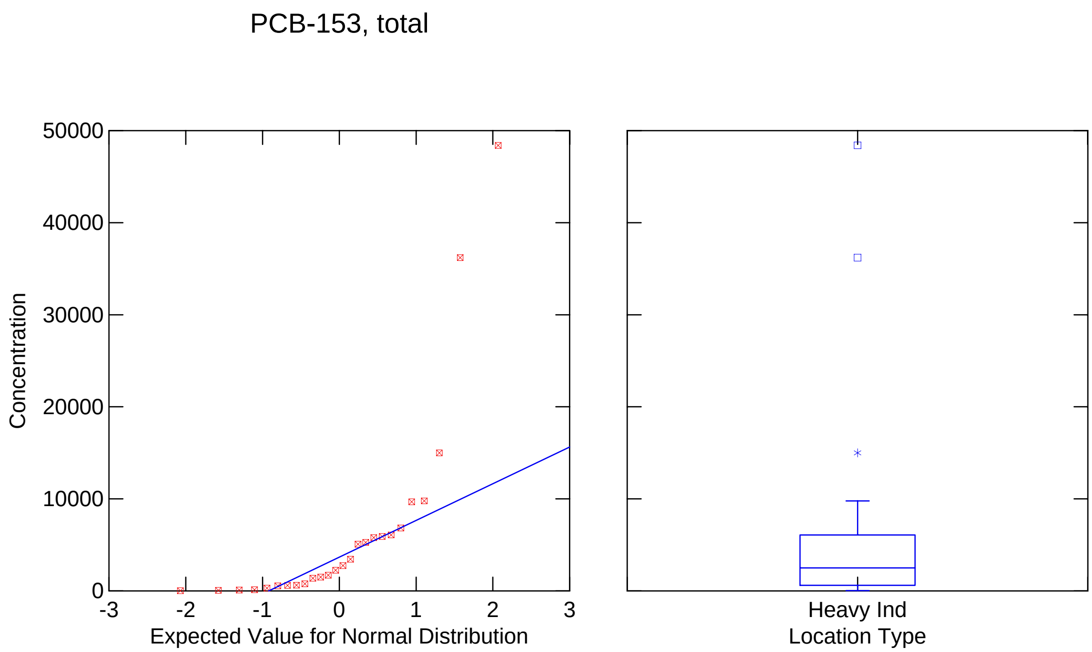
PCB-106, total



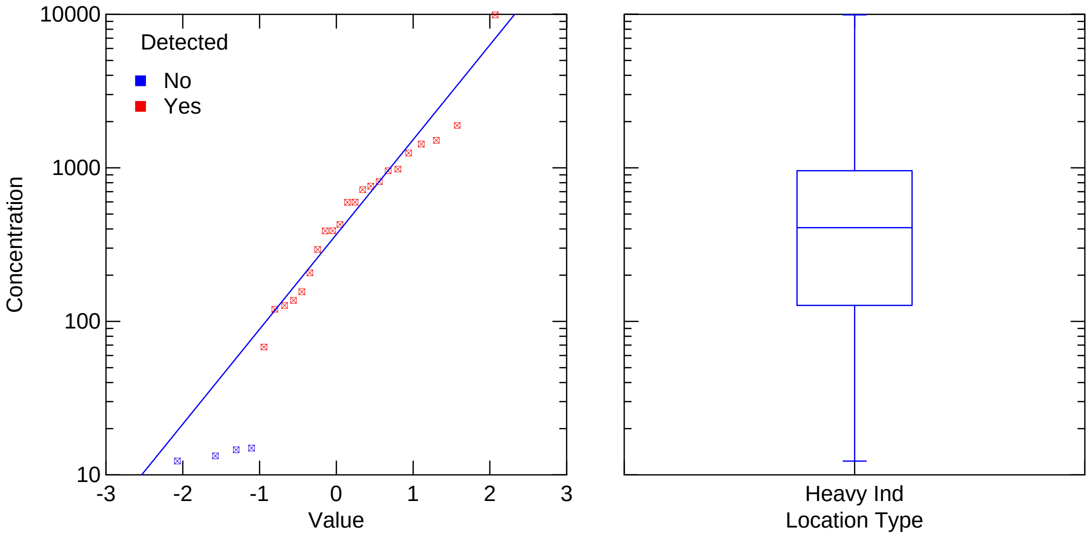
PCB-106, total



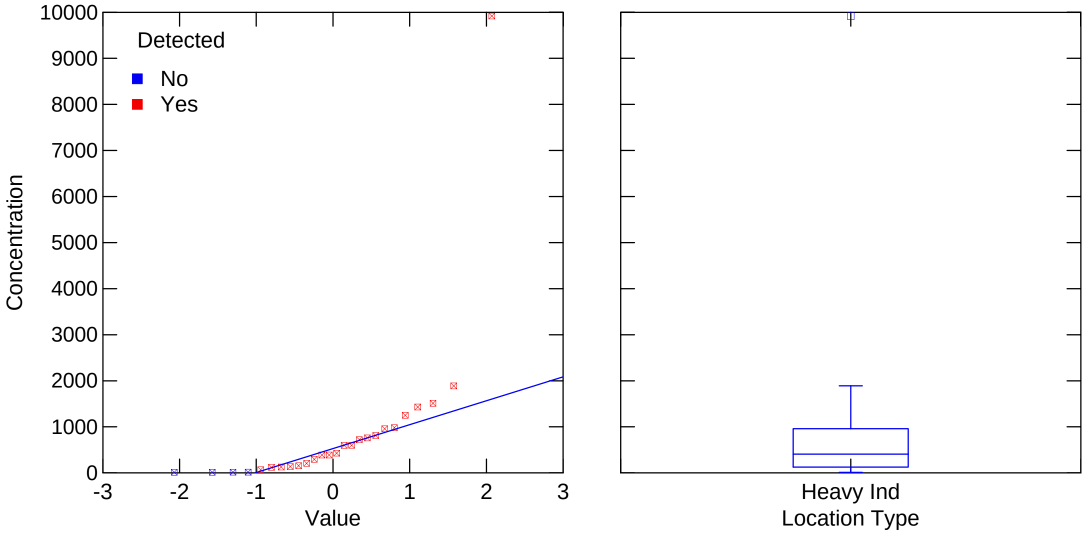

PCB-153, total
Concentration
10000
1000
100
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type


PCB-153, total
Concentration
50000
40000
30000
20000
10000
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

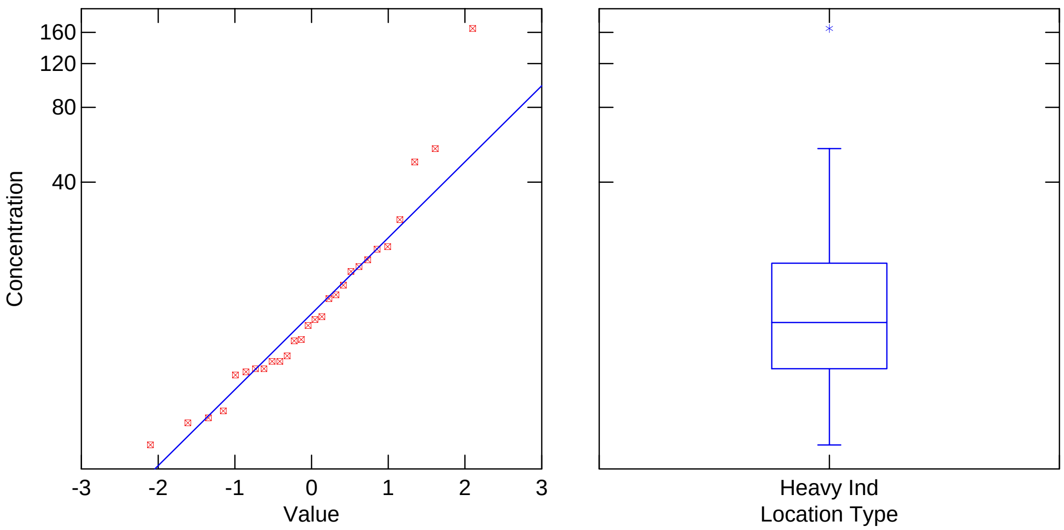
PCB-194, total



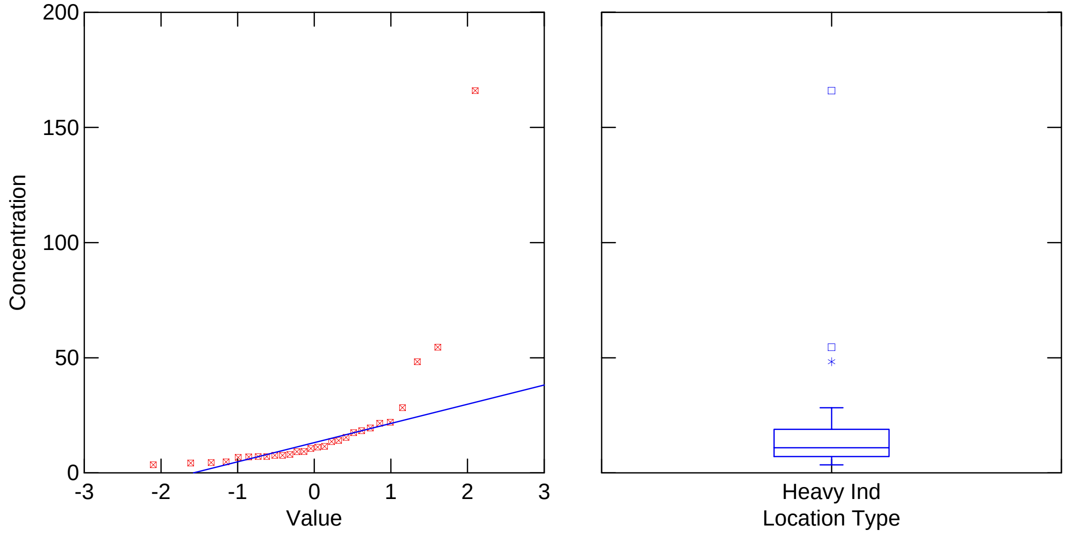
PCB-194, total



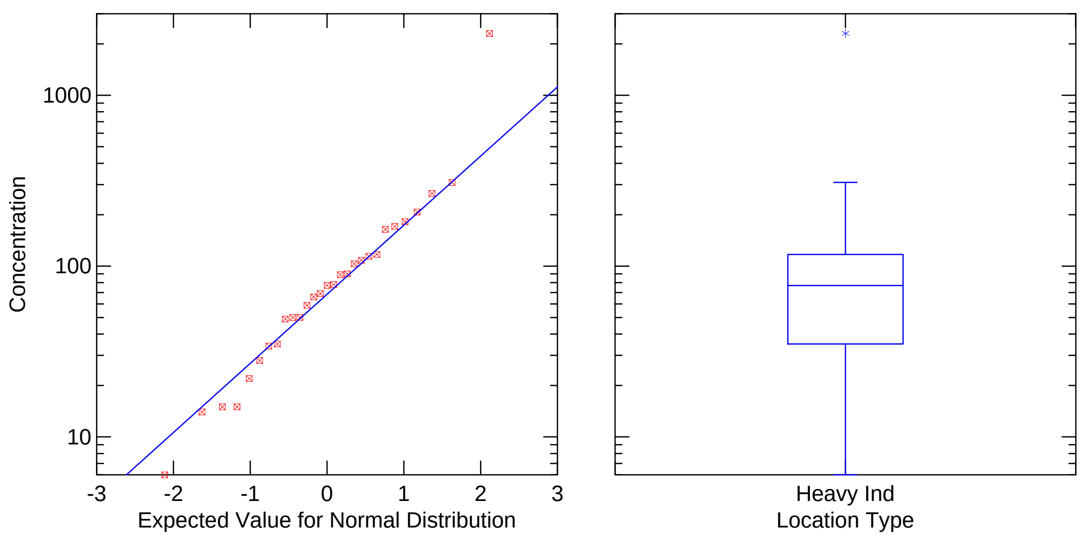
TOC

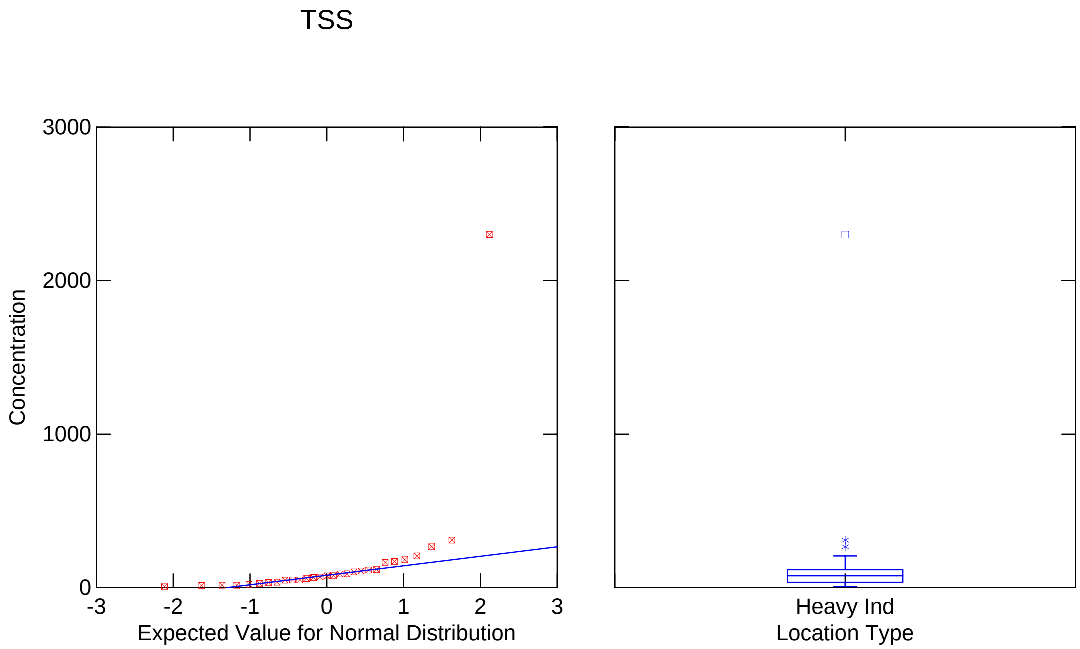


TOC


200
150
100
50
0
Concentration
-3
-2
-1
0
1
2
3
Value
Heavy Ind
Location Type

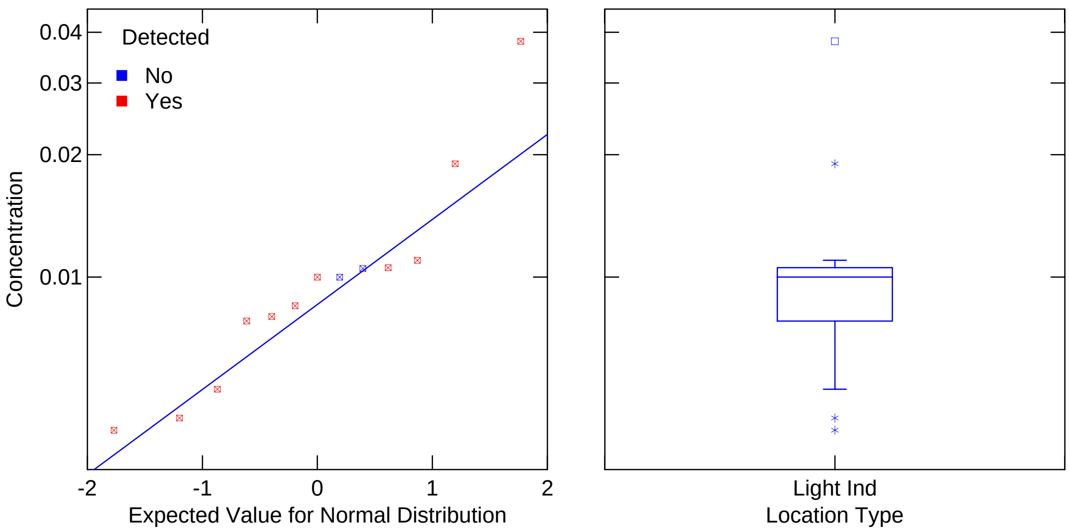
TSS


1000
100
10
Concentration
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

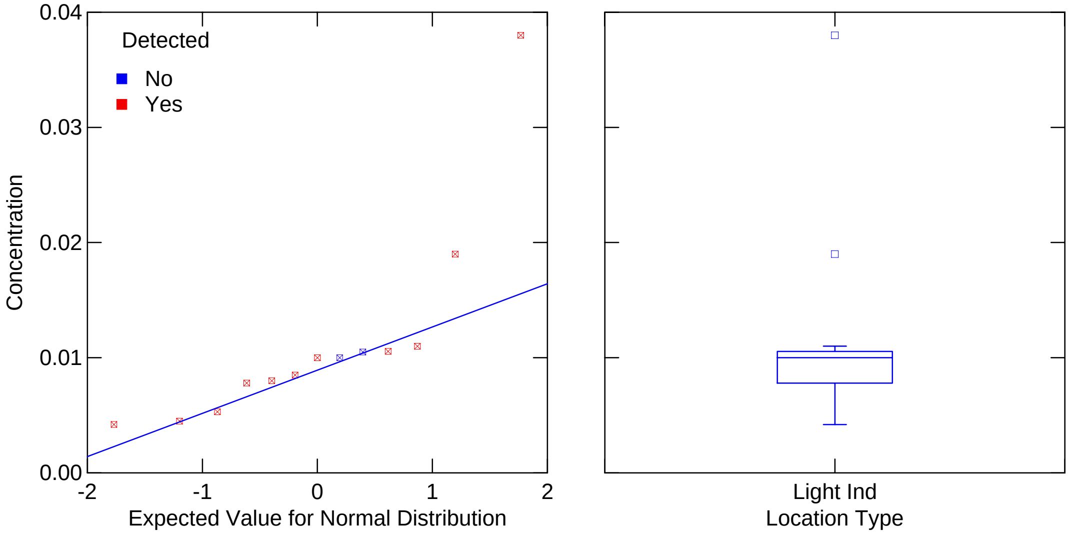

TSS
3000
2000
1000
0
Concentration
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

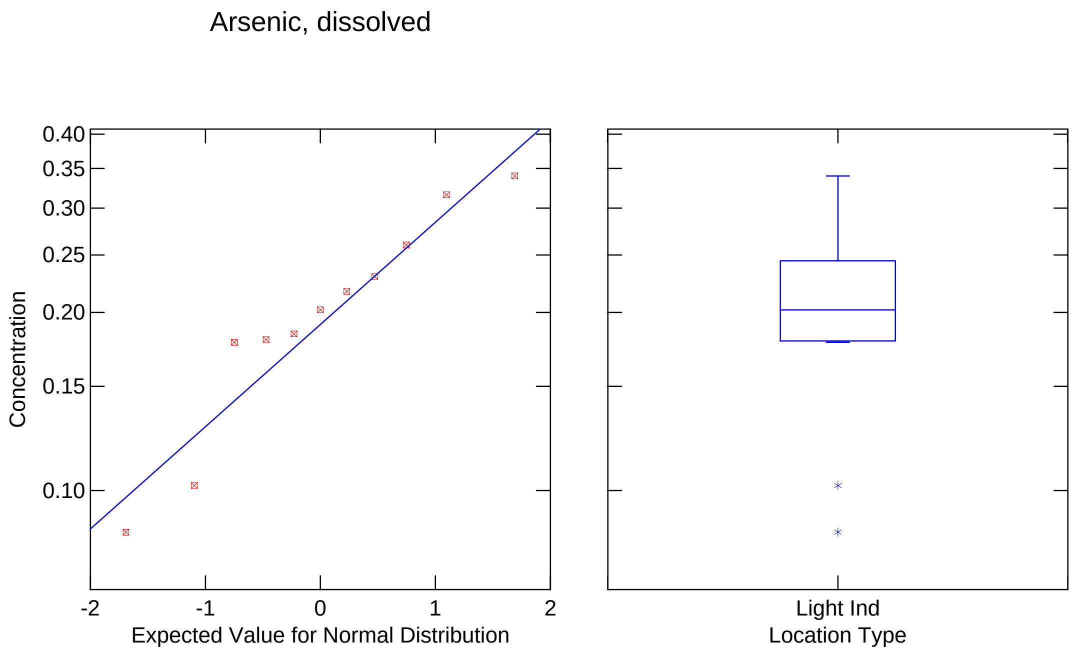
ORIGINAL DATA - REPRESENTATIVE LIGHT INDUSTRIAL LOCATIONS

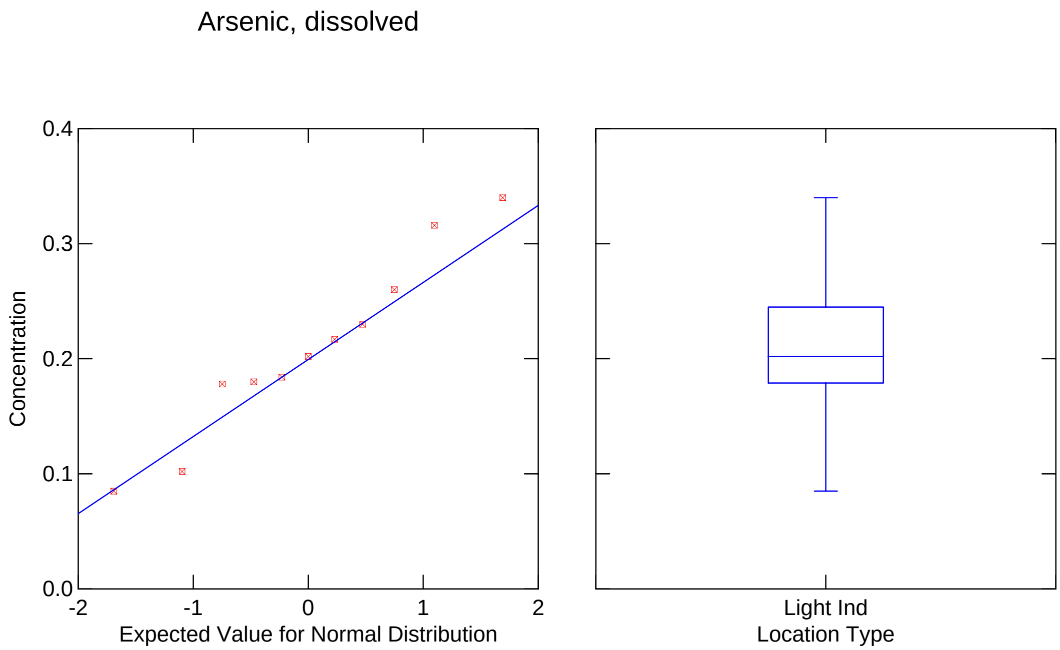
Acenaphthylene, Total

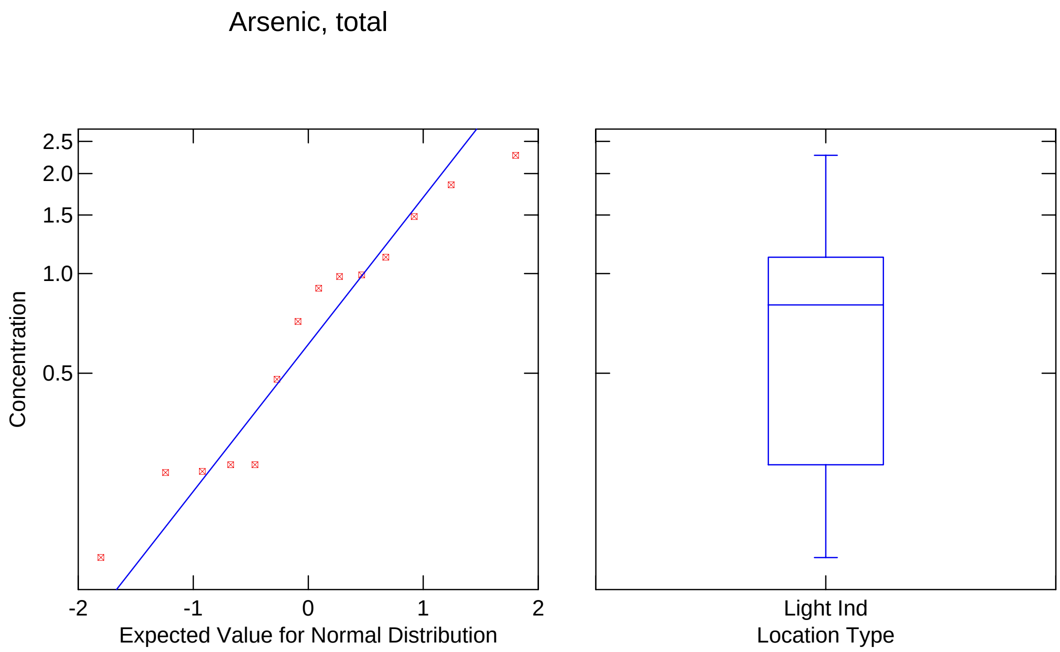


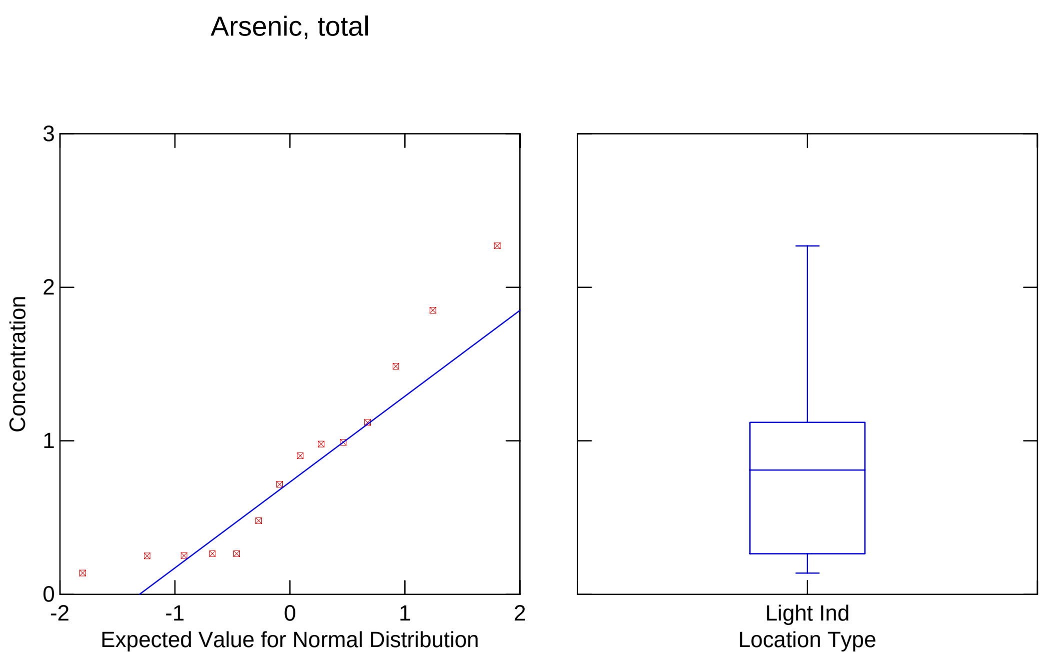
Acenaphthylene, Total

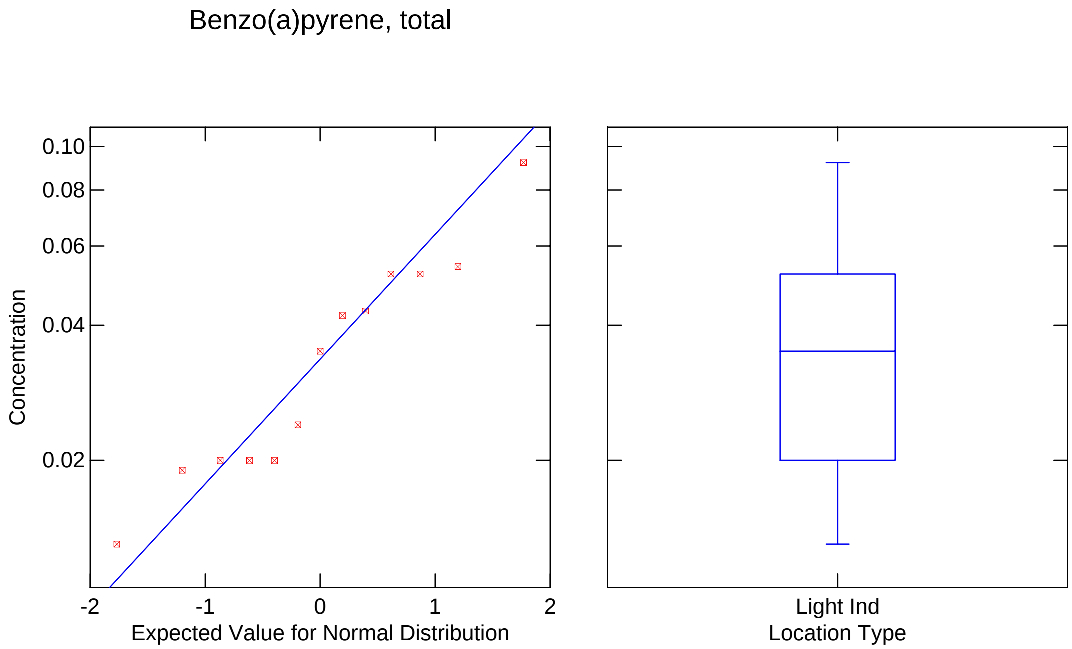


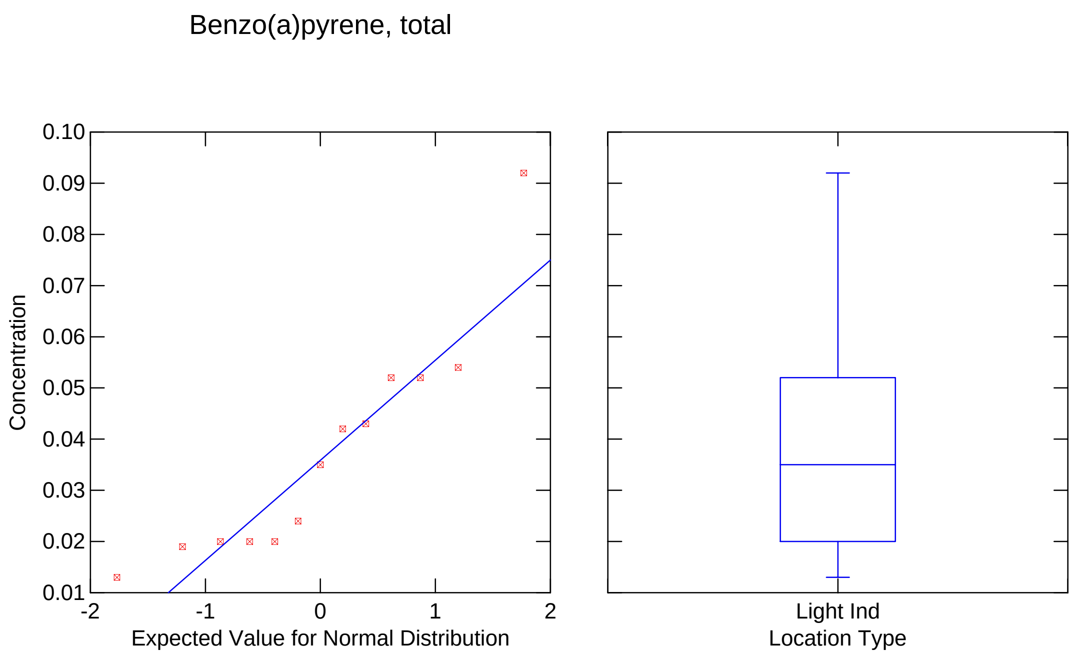

Arsenic, dissolved
Concentration
0.40
0.35
0.30
0.25
0.20
0.15
0.10
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

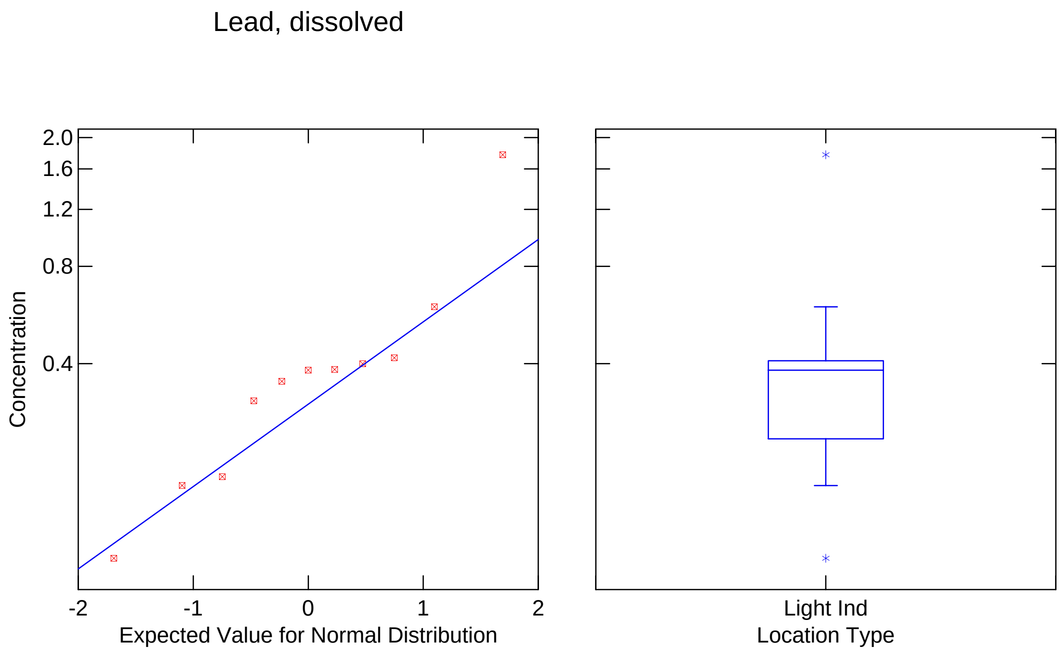

Arsenic, dissolved
Concentration
0.4
0.3
0.2
0.1
0.0
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

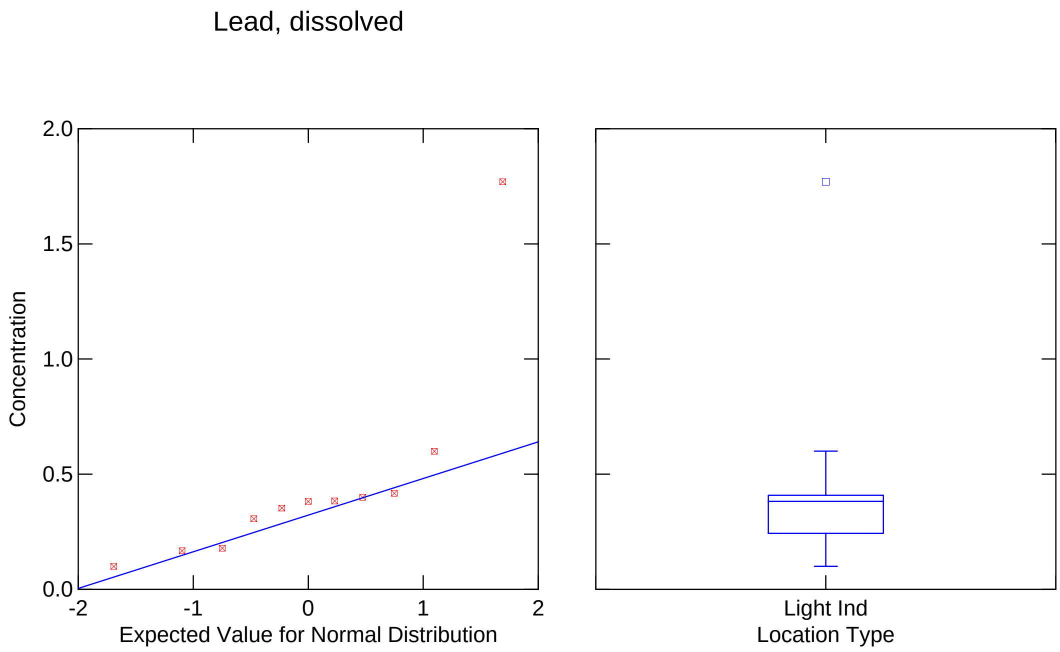

Arsenic, total
Concentration
2.5
2.0
1.5
1.0
0.5
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

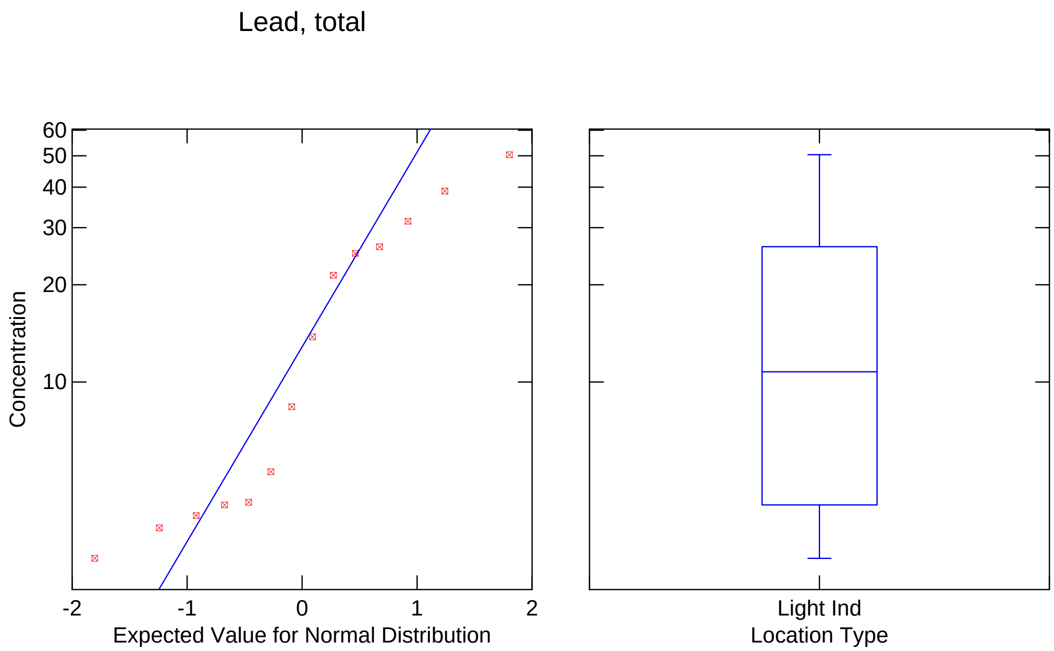

Arsenic, total
Concentration
3
2
1
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

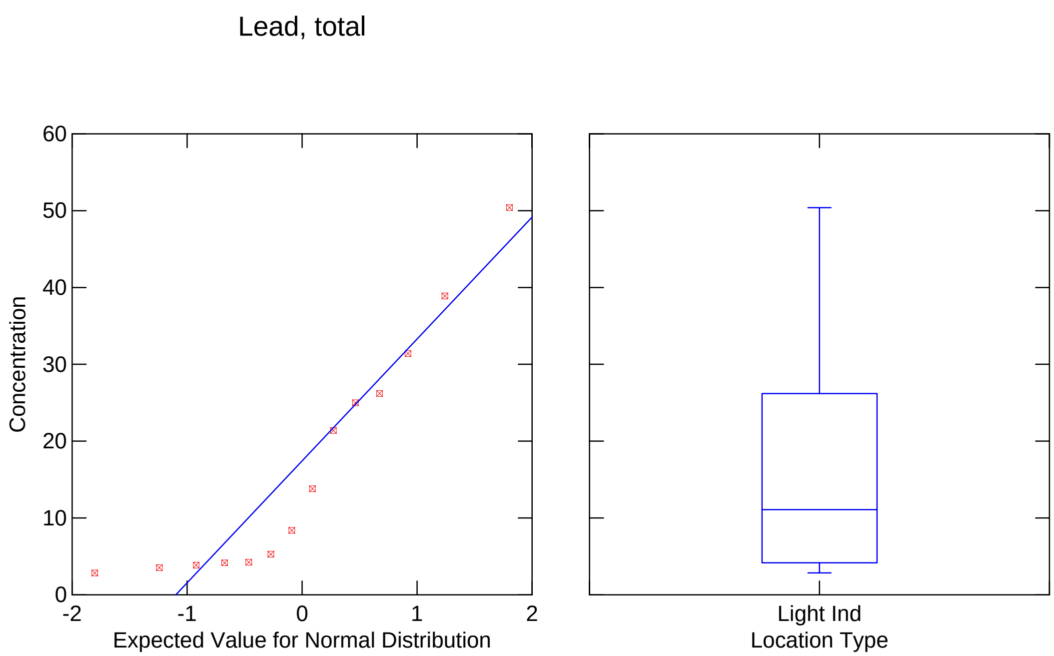

Benzo(a)pyrene, total
Concentration
0.10
0.08
0.06
0.04
0.02
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type


Benzo(a)pyrene, total
Concentration
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

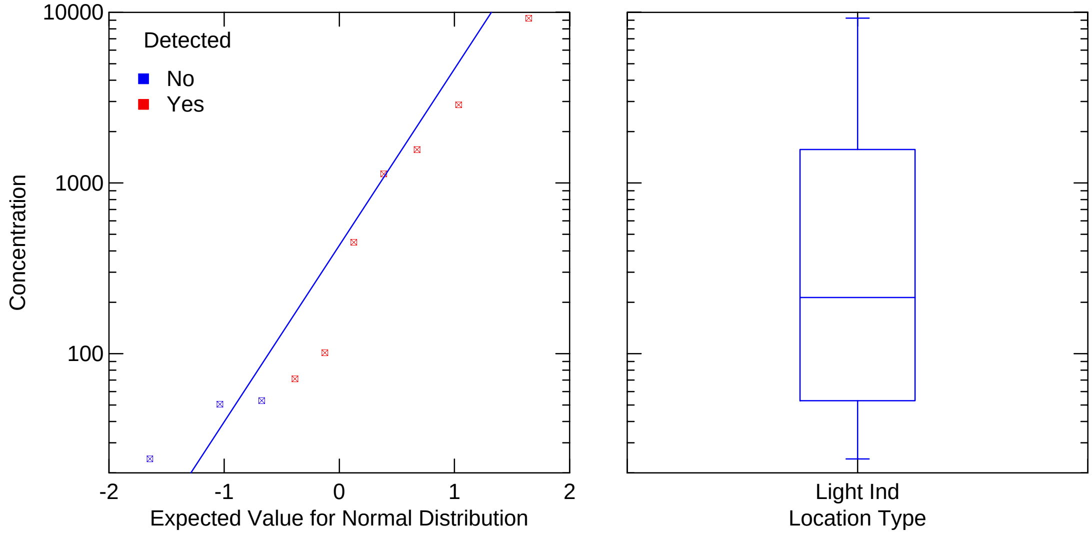

Lead, dissolved
Concentration
2.0
1.6
1.2
0.8
0.4
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type


Lead, dissolved
Concentration
2.0
1.5
1.0
0.5
0.0
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

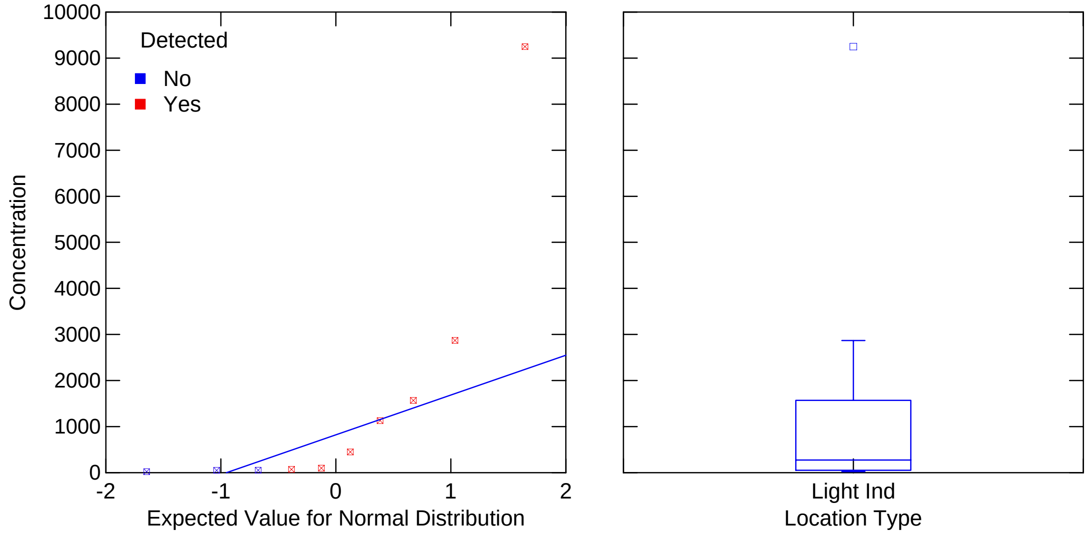

Lead, total
Concentration
60
50
40
30
20
10
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type


Lead, total
Concentration
60
50
40
30
20
10
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

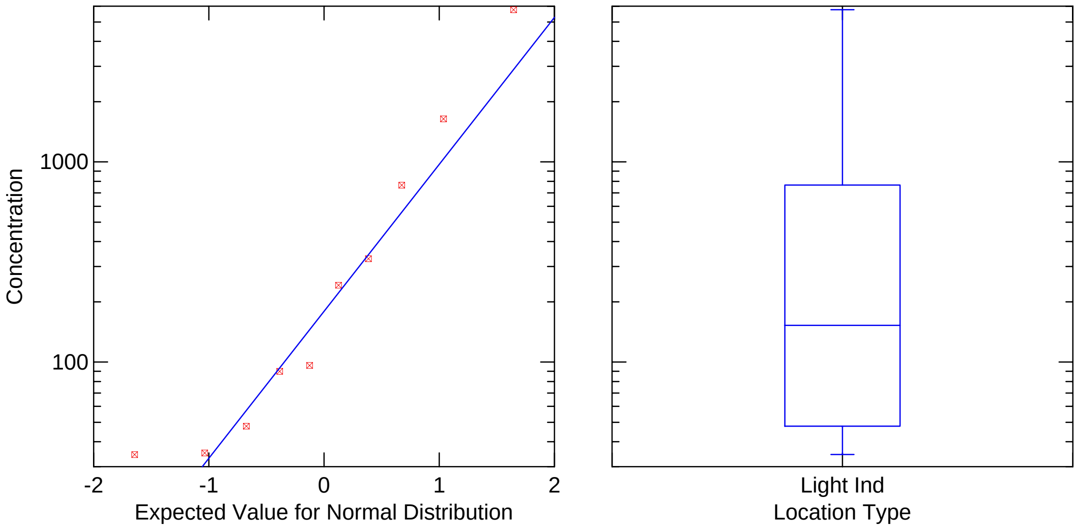
PCB-018, total



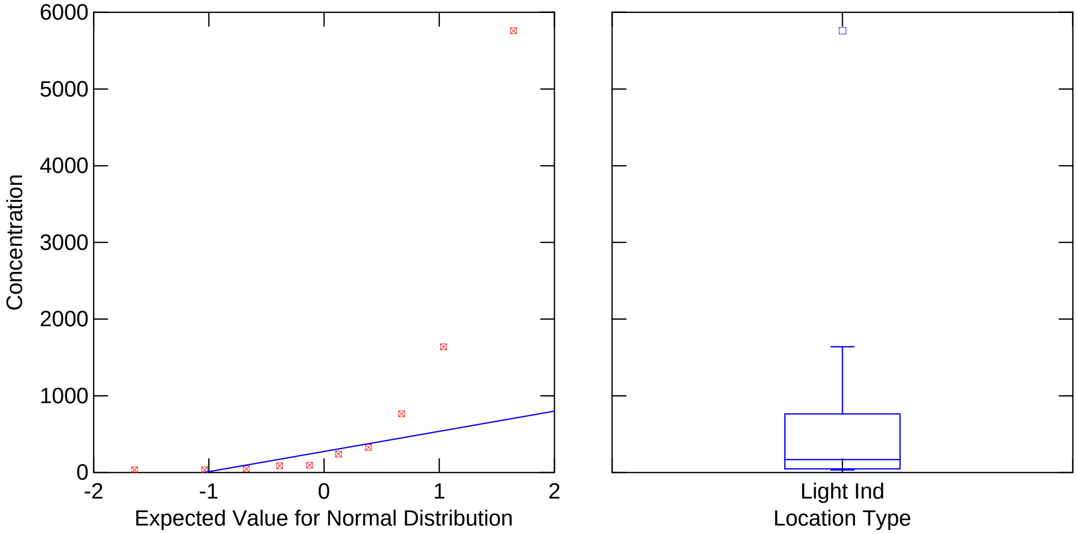
PCB-018, total



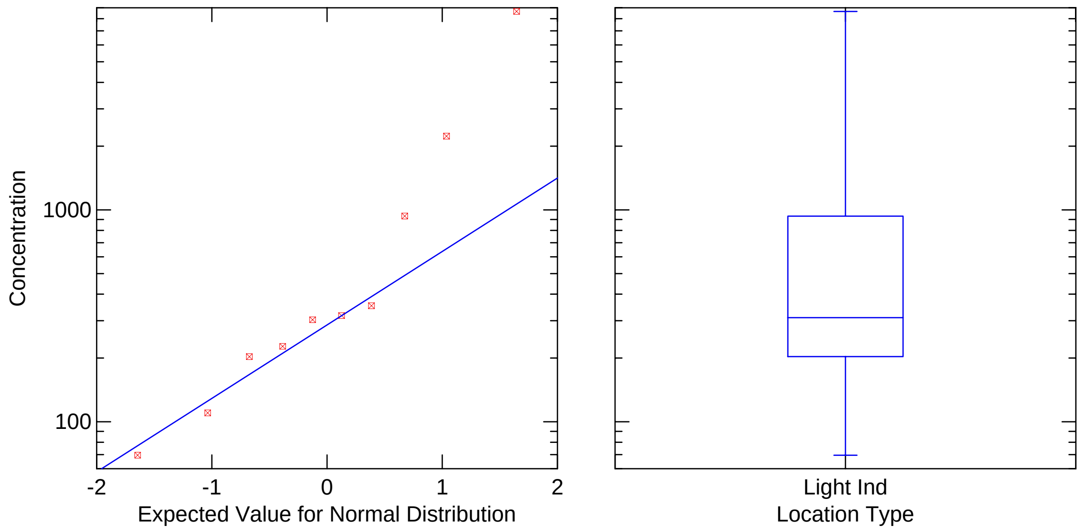
PCB-066, total



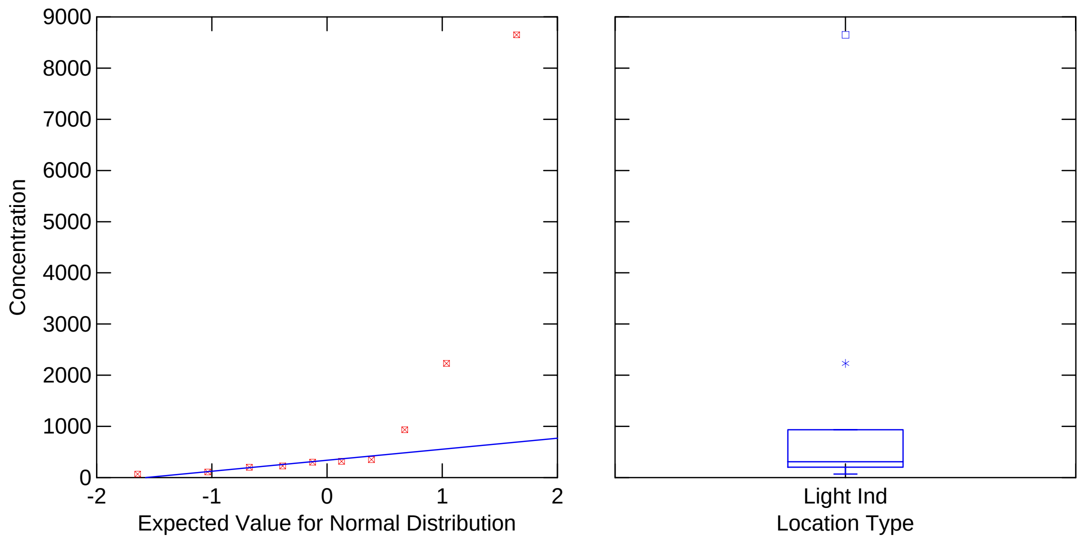
PCB-066, total

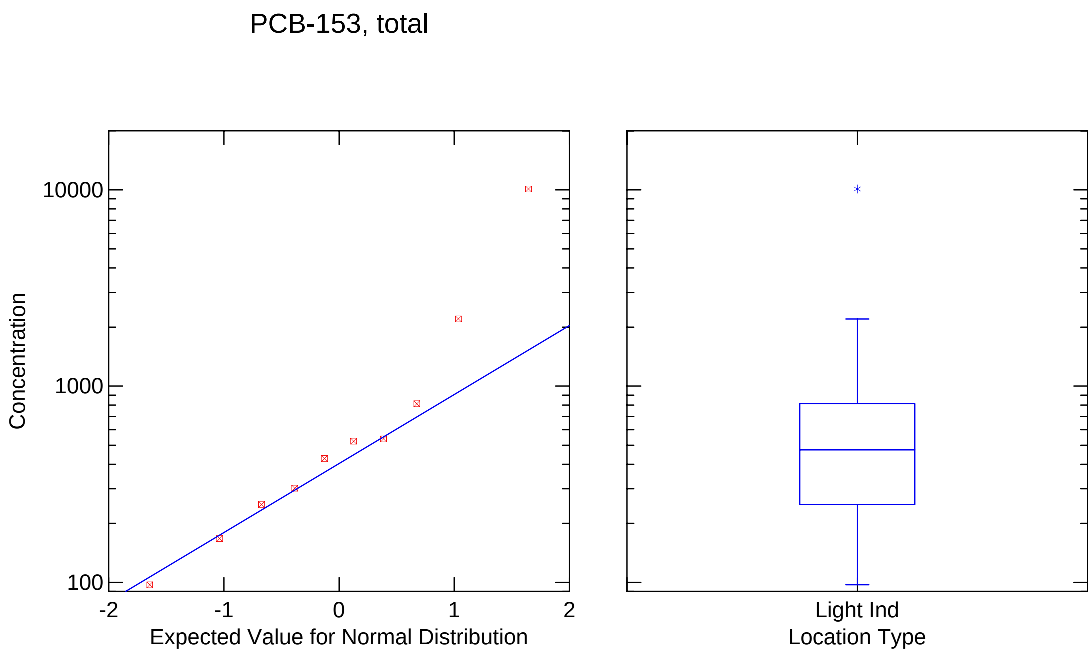


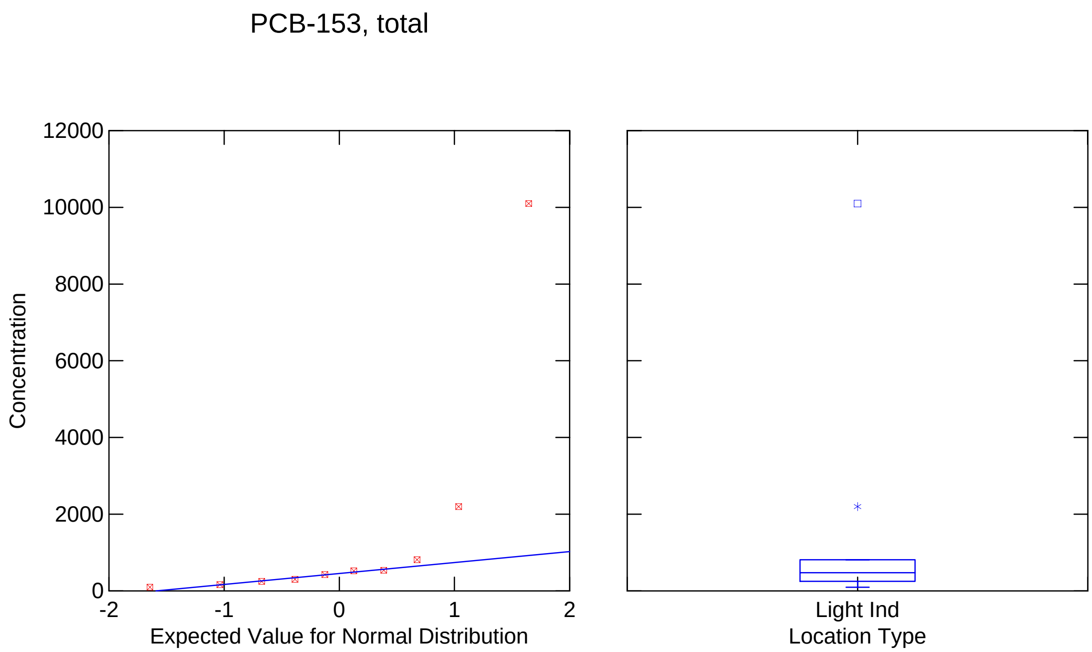
PCB-106, total



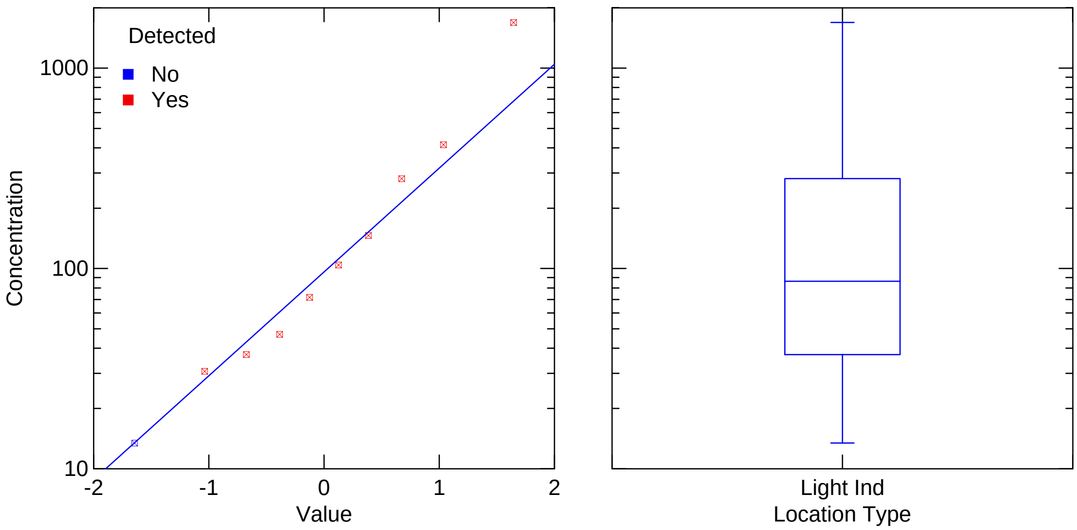
PCB-106, total



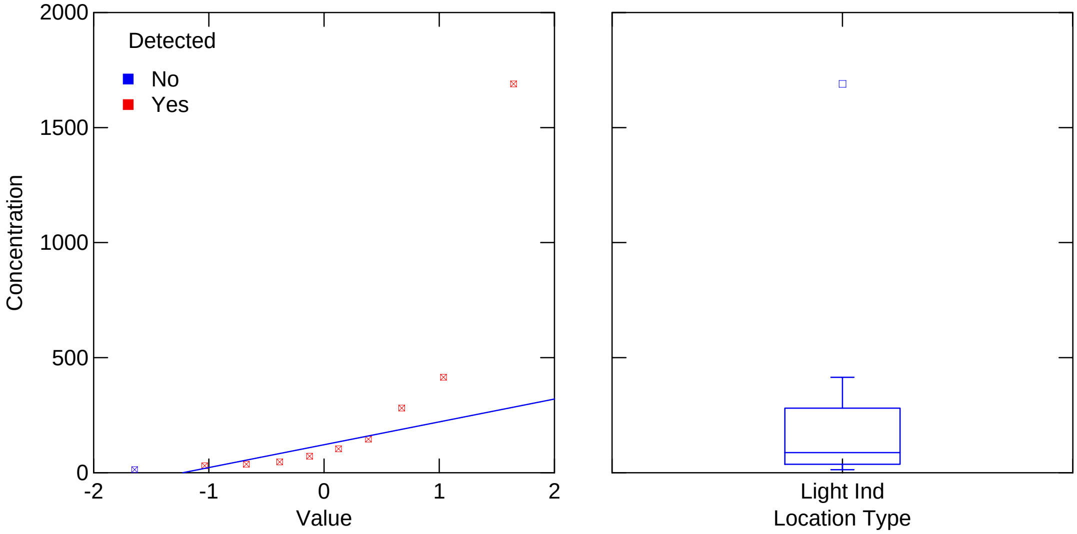

PCB-153, total
10000
1000
100
Concentration
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

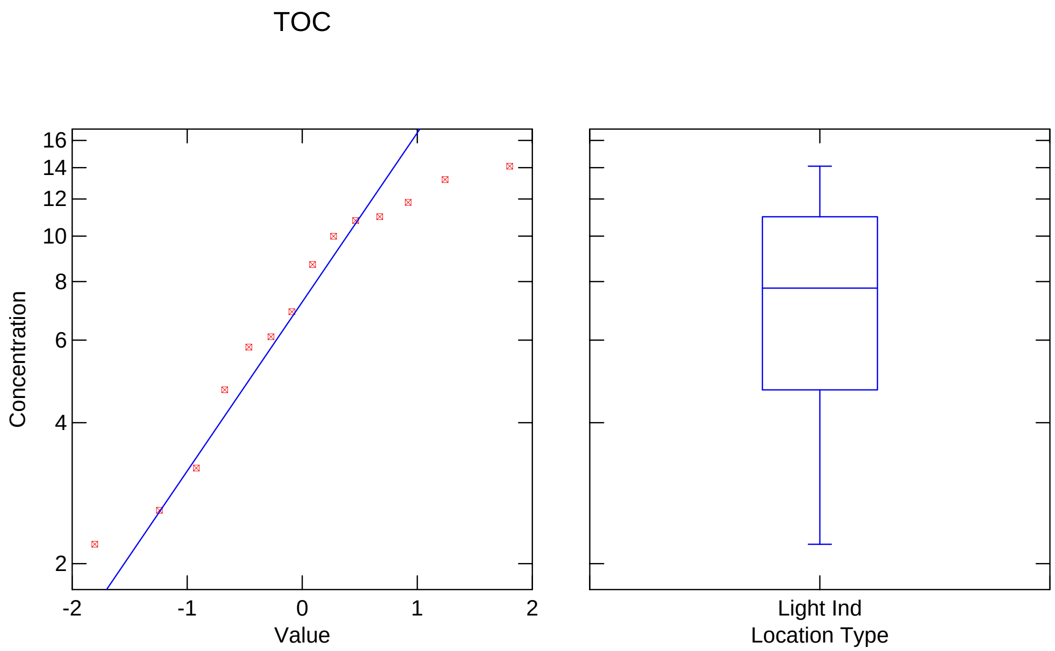

PCB-153, total
12000
10000
8000
6000
4000
2000
0
Concentration
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

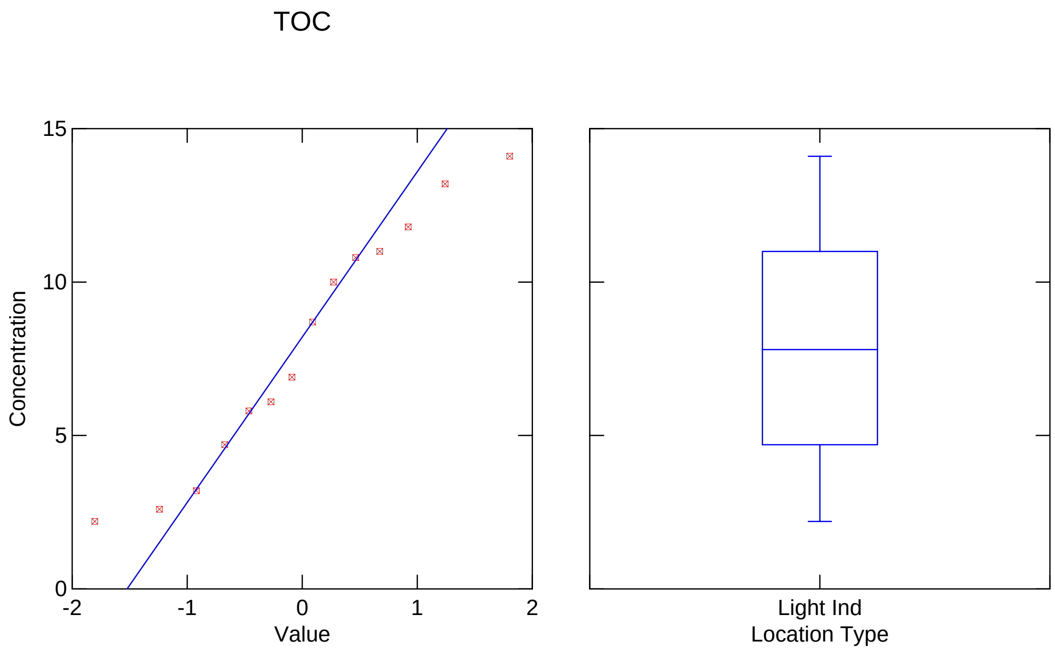
PCB-194, total

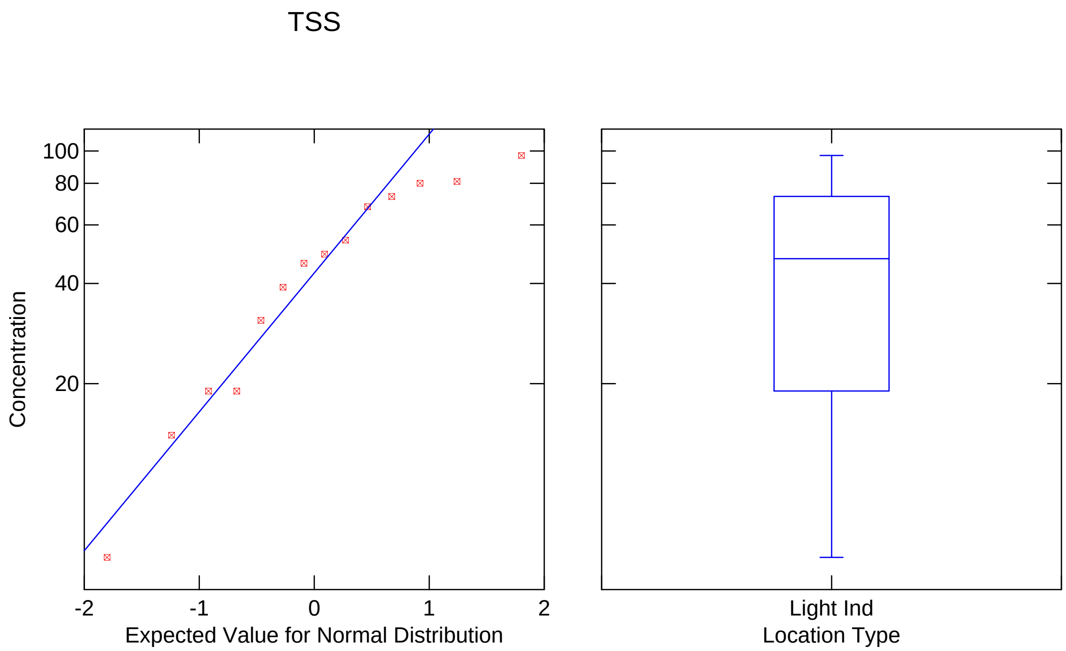


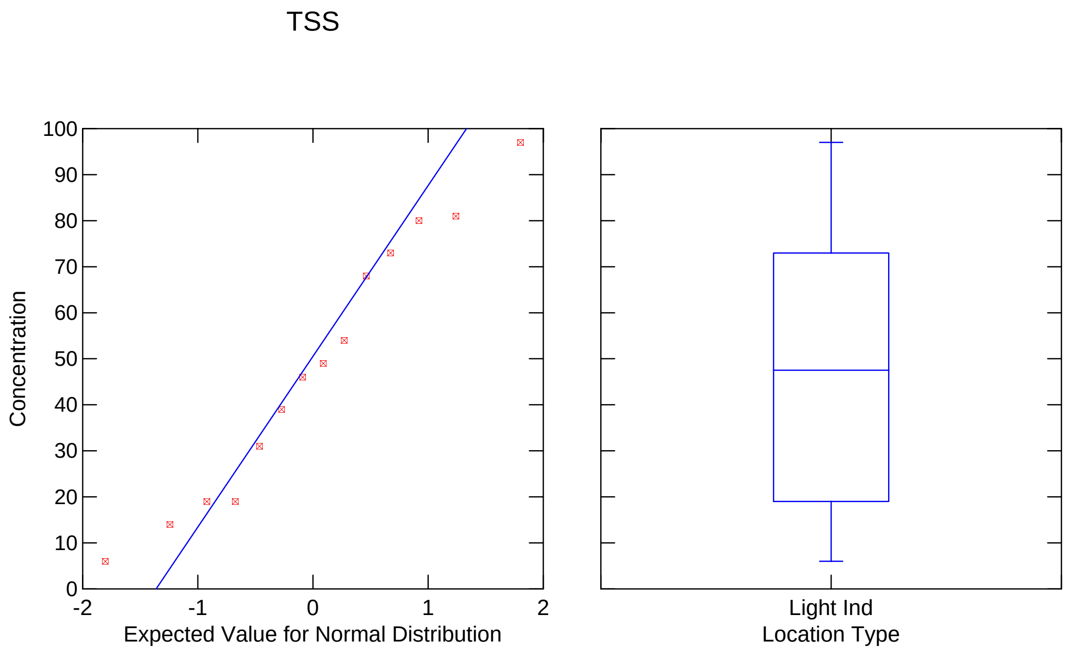
PCB-194, total




TOC
16
14
12
10
8
6
4
2
Concentration
-2
-1
0
1
2
Value
Light Ind
Location Type


TOC
15
10
5
0
Concentration
-2
-1
0
1
2
Value
Light Ind
Location Type



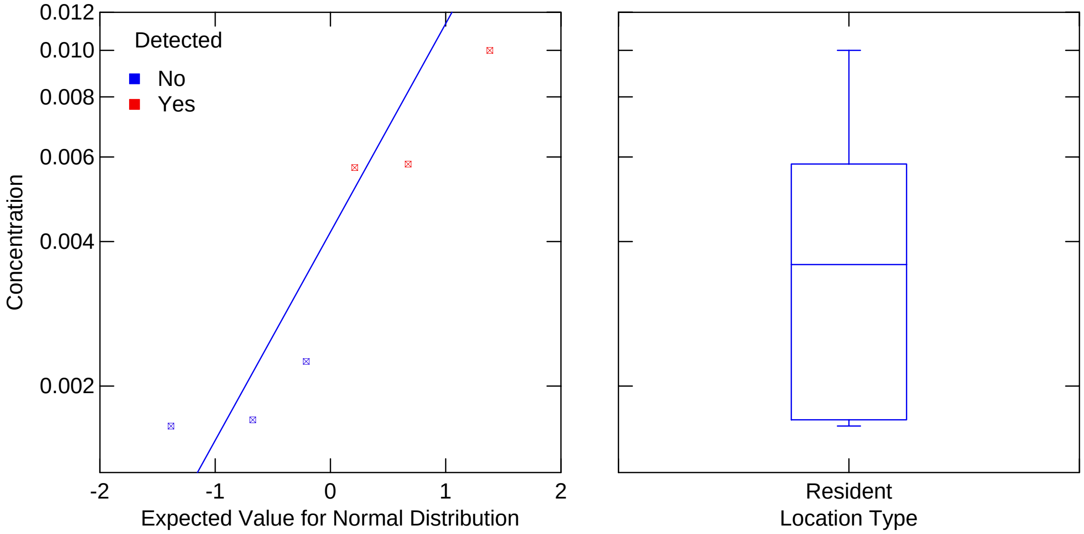


NOTE: Insufficient number of samples to create graphs for

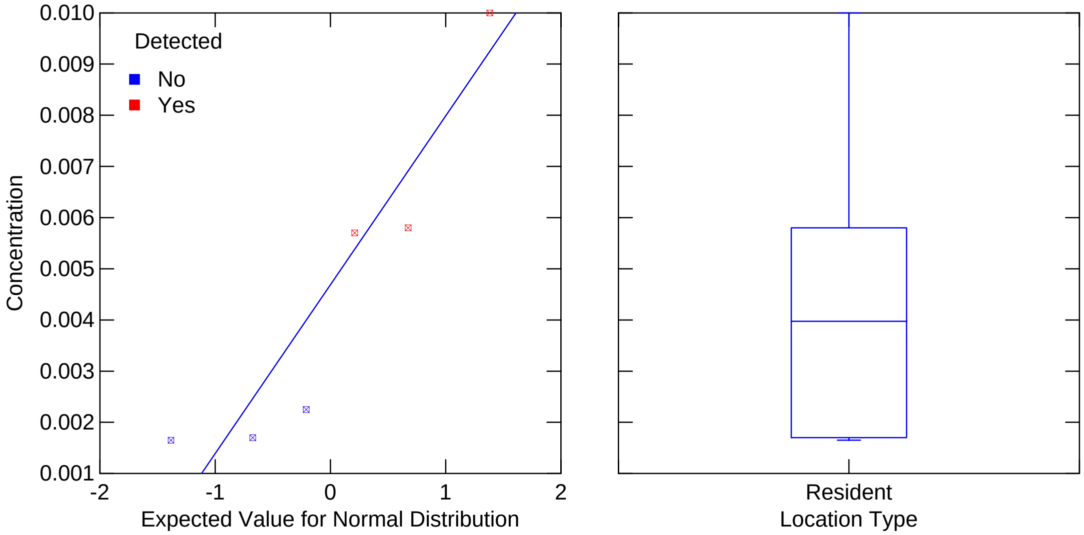
- Multiple Land Use – Open Space/Heavy Industrial
- Representative Land Use – Open Space

ORIGINAL DATA - REPRESENTATIVE RESIDENTIAL LOCATIONS

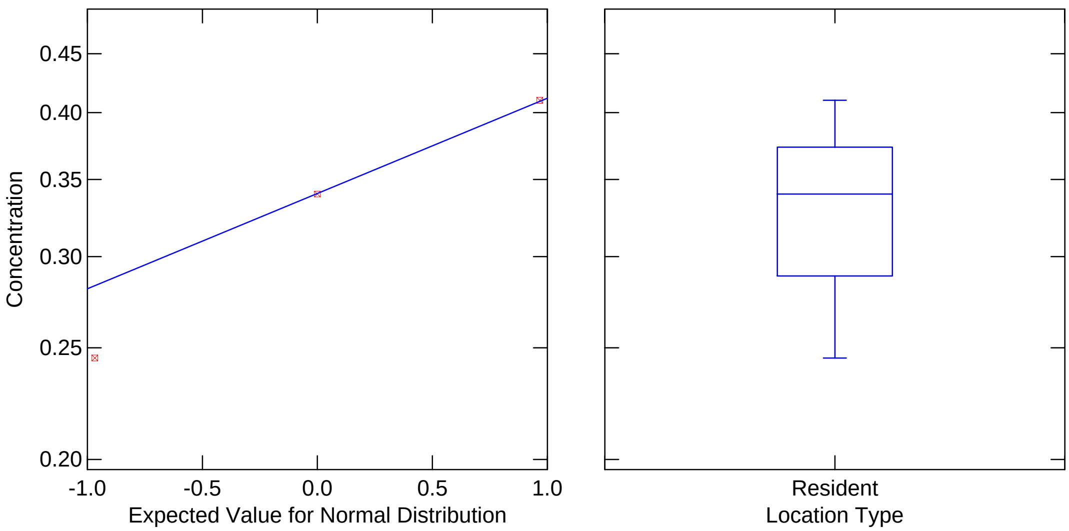
Acenaphythlene, Total



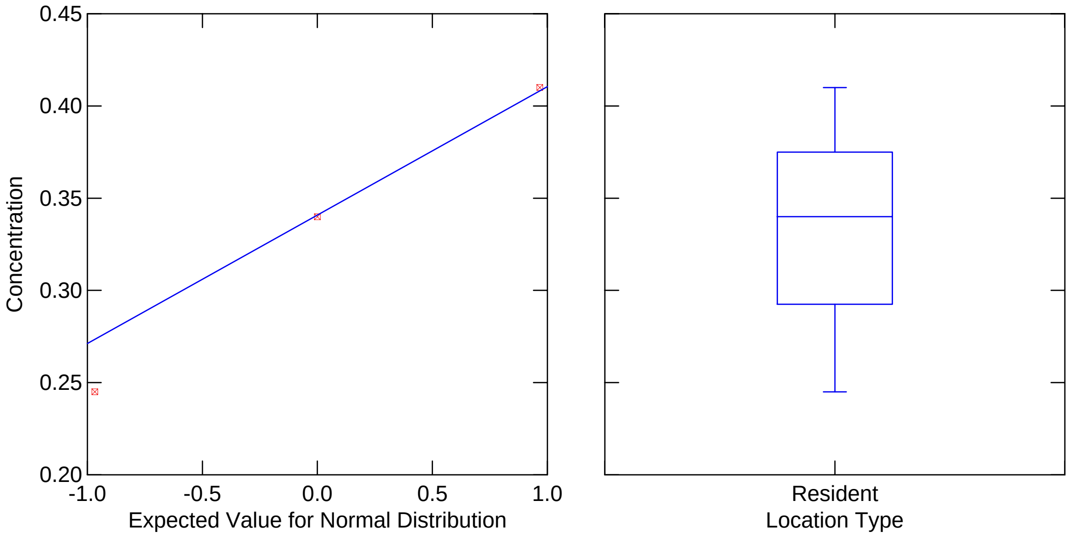
Acenaphythlene, Total

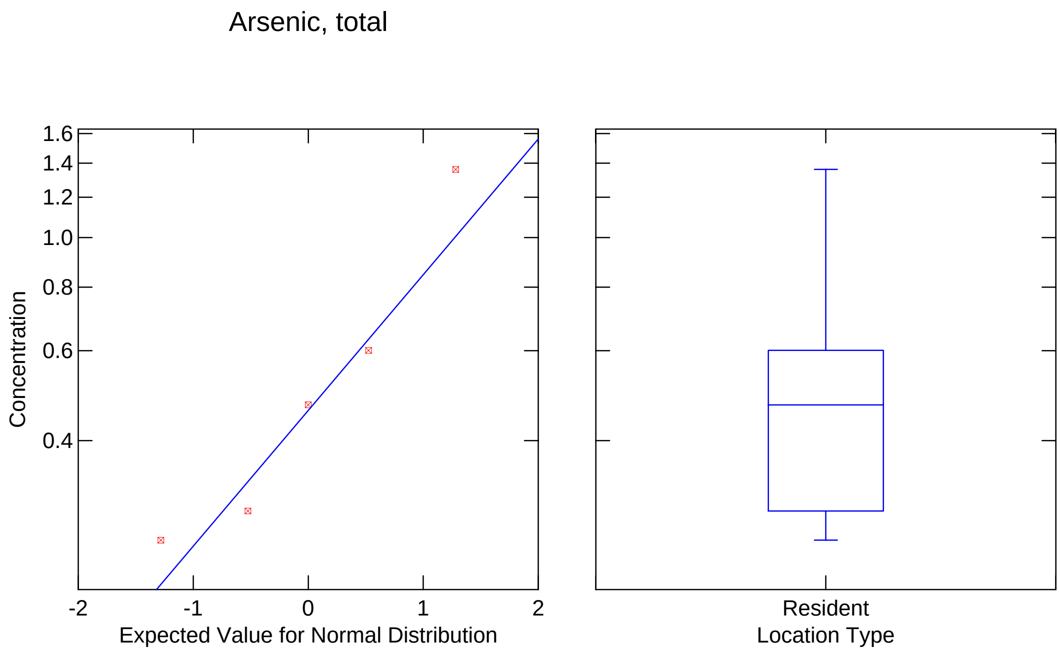


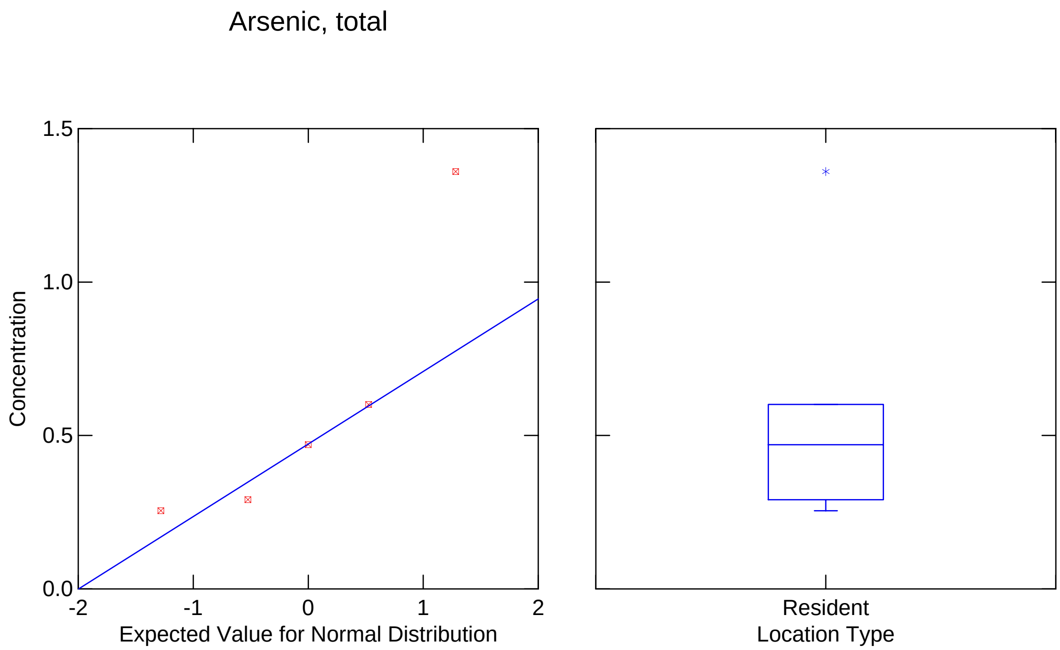
Arsenic, dissolved



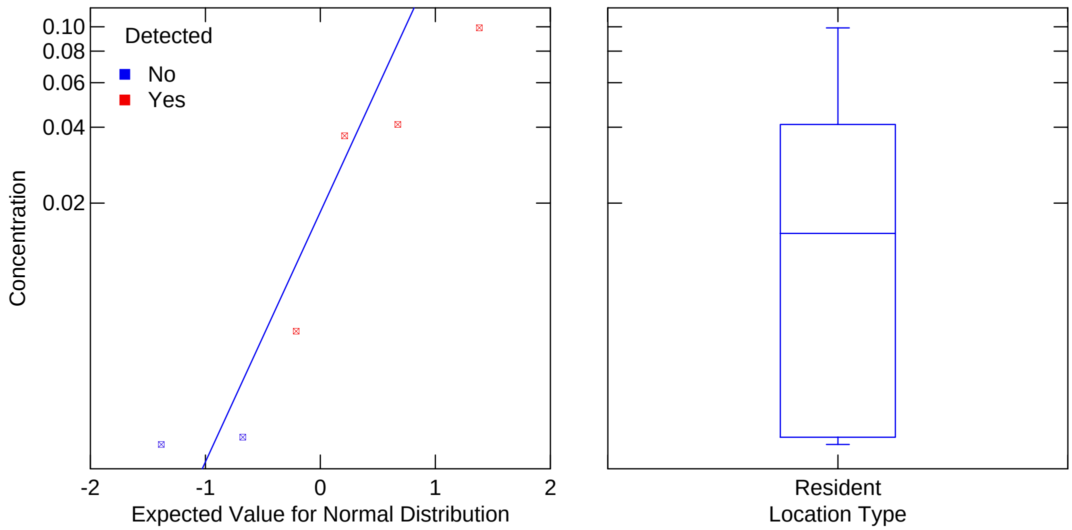
Arsenic, dissolved



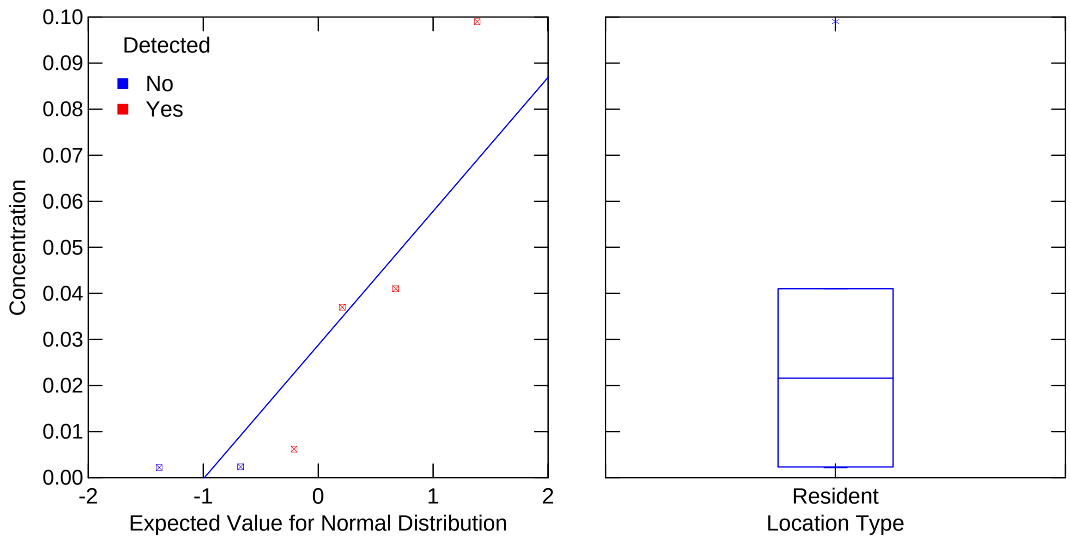

Arsenic, total
Concentration
1.6
1.4
1.2
1.0
0.8
0.6
0.4
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type


Arsenic, total
Concentration
1.5
1.0
0.5
0.0
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

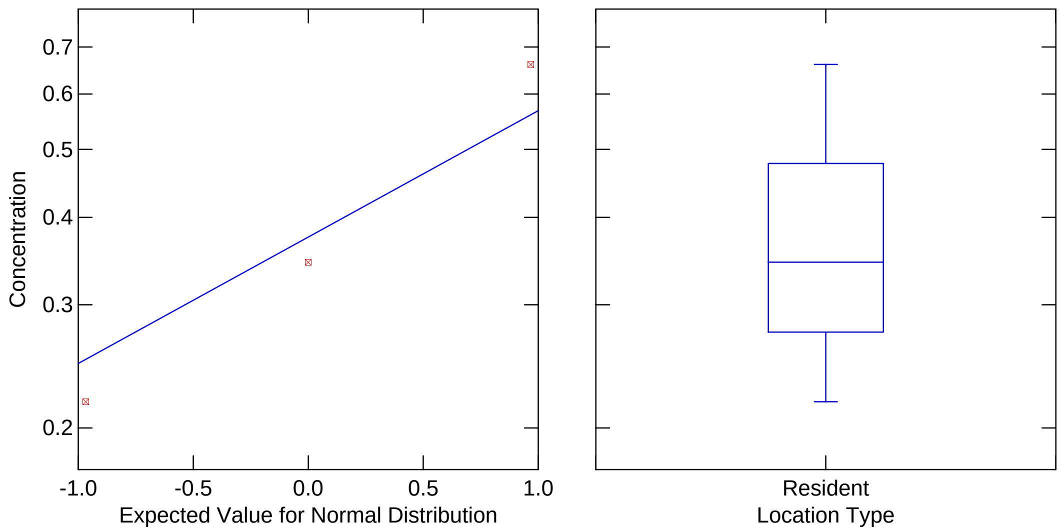
Benzo(a)pyrene, total



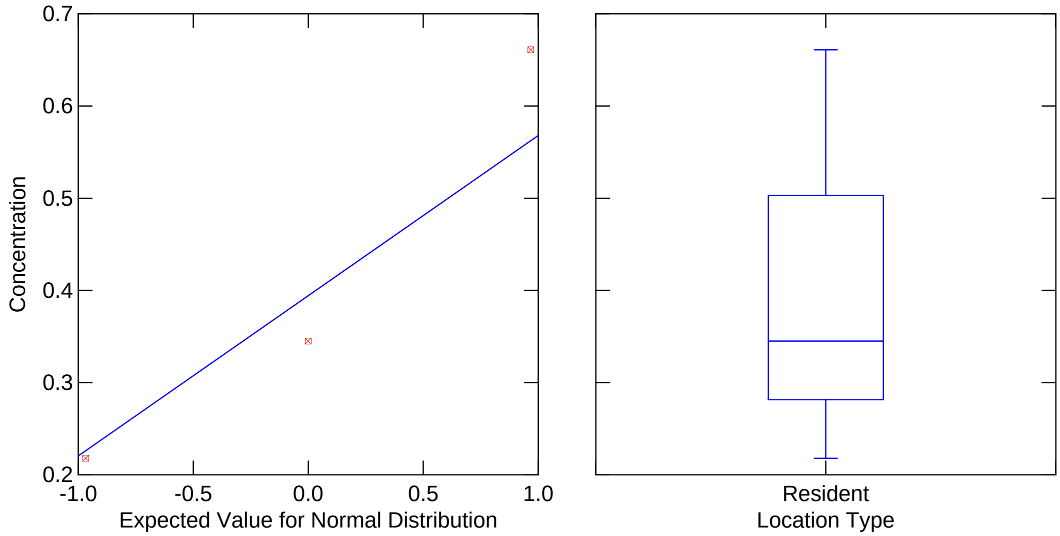
Benzo(a)pyrene, total

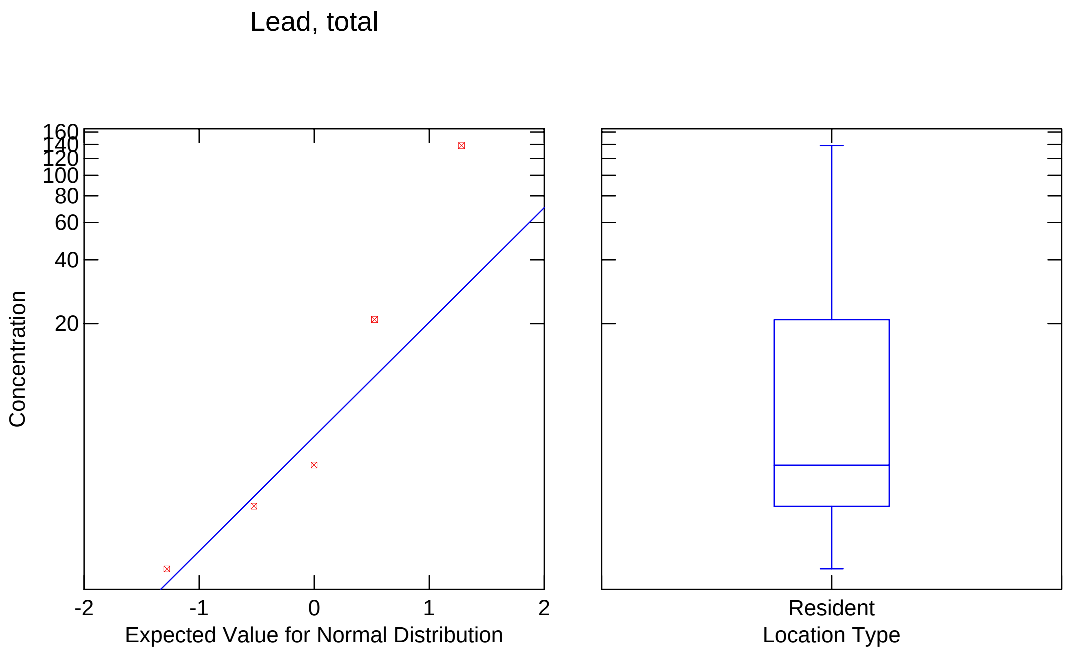


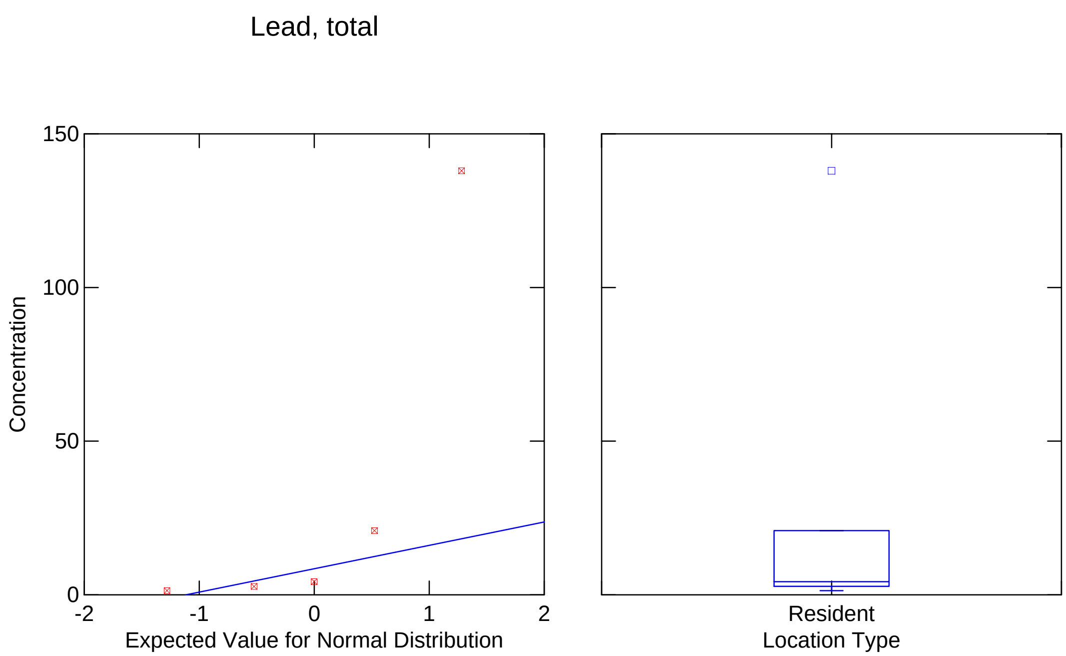
Lead, dissolved

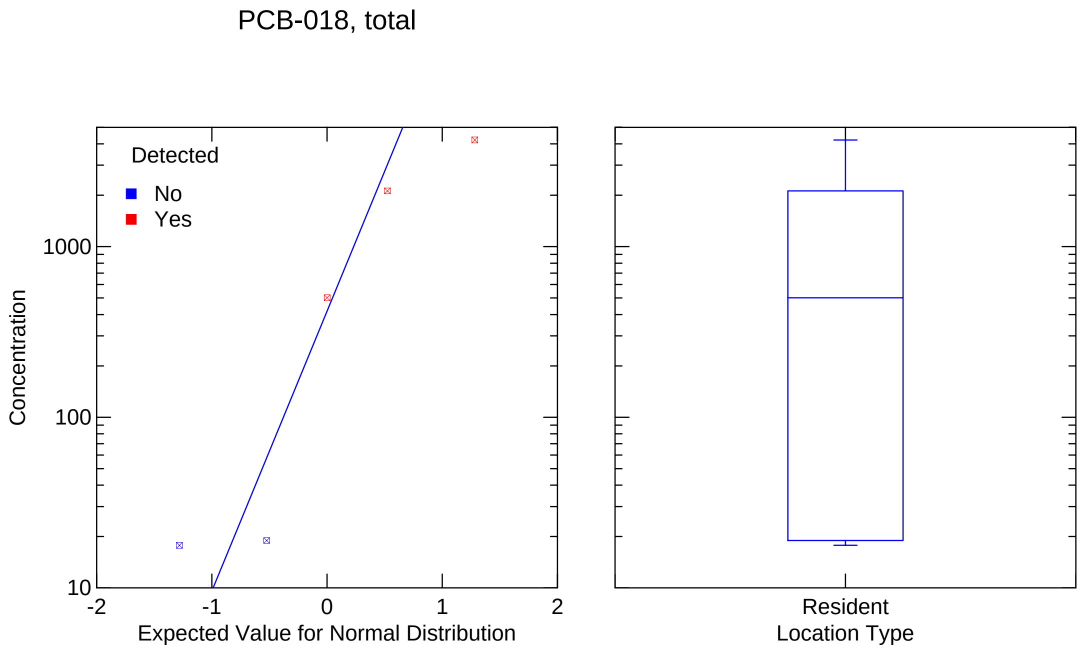


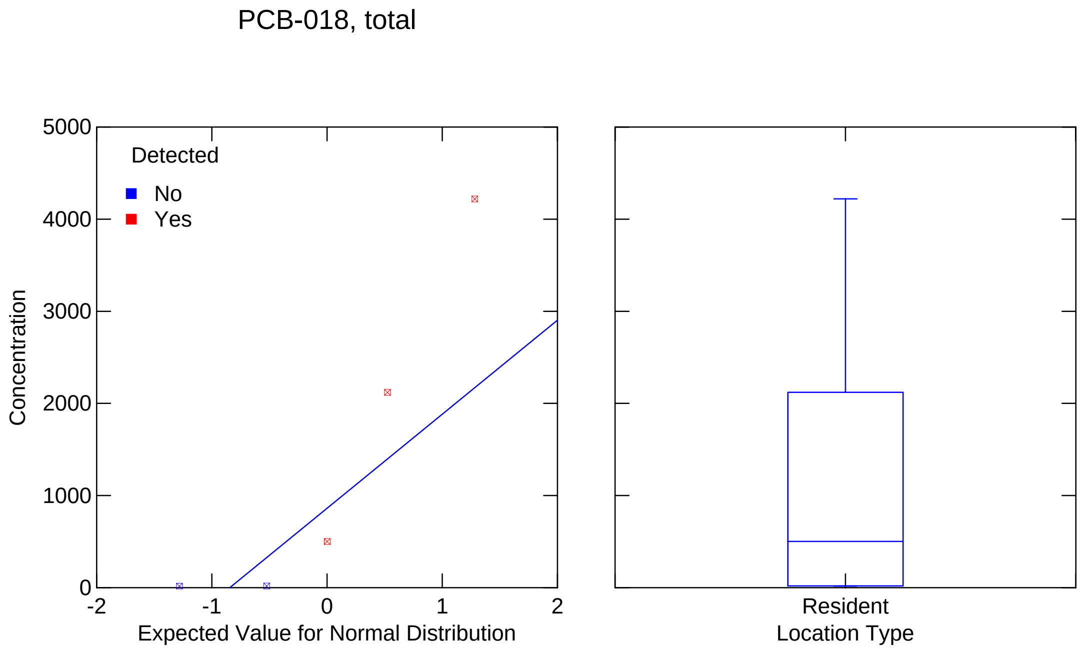
Lead, dissolved

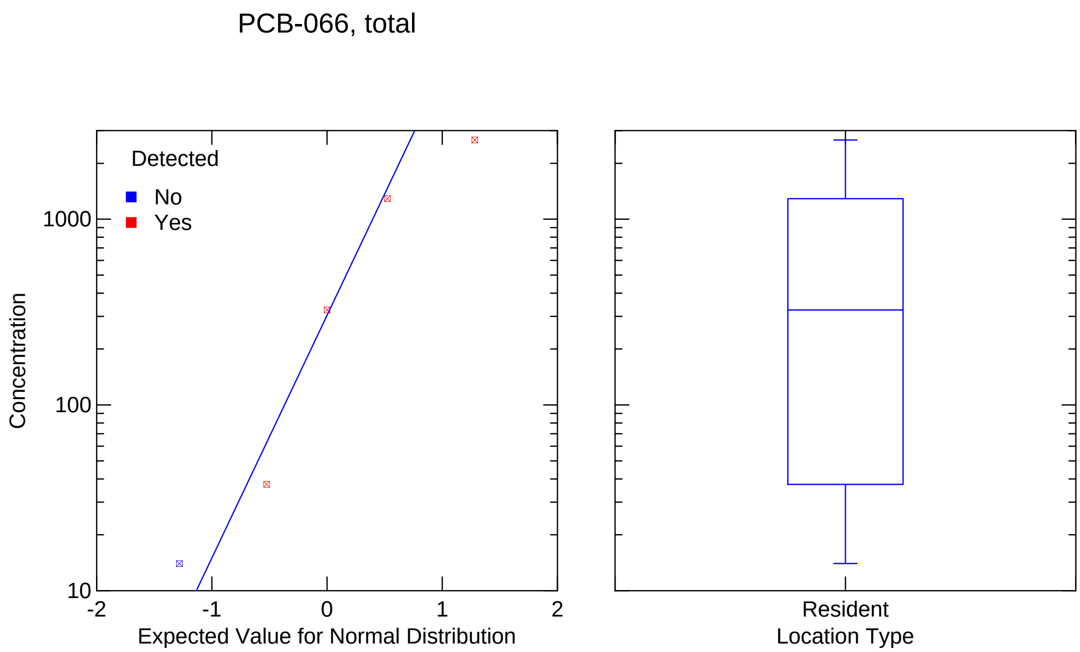


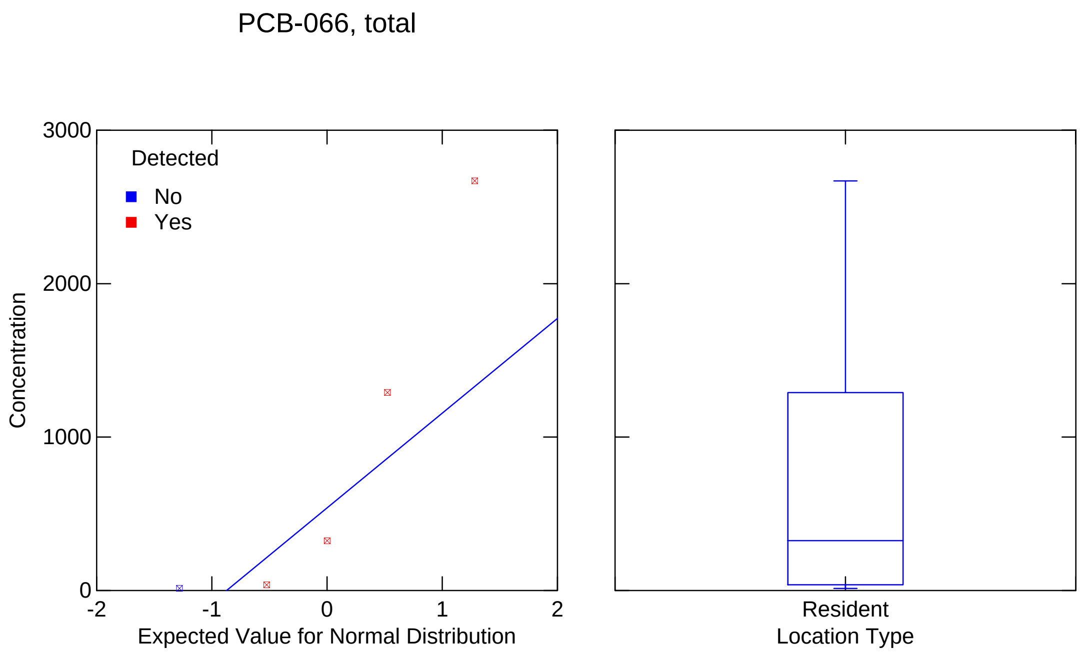

Lead, total
Concentration
160
140
120
100
80
60
40
20
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

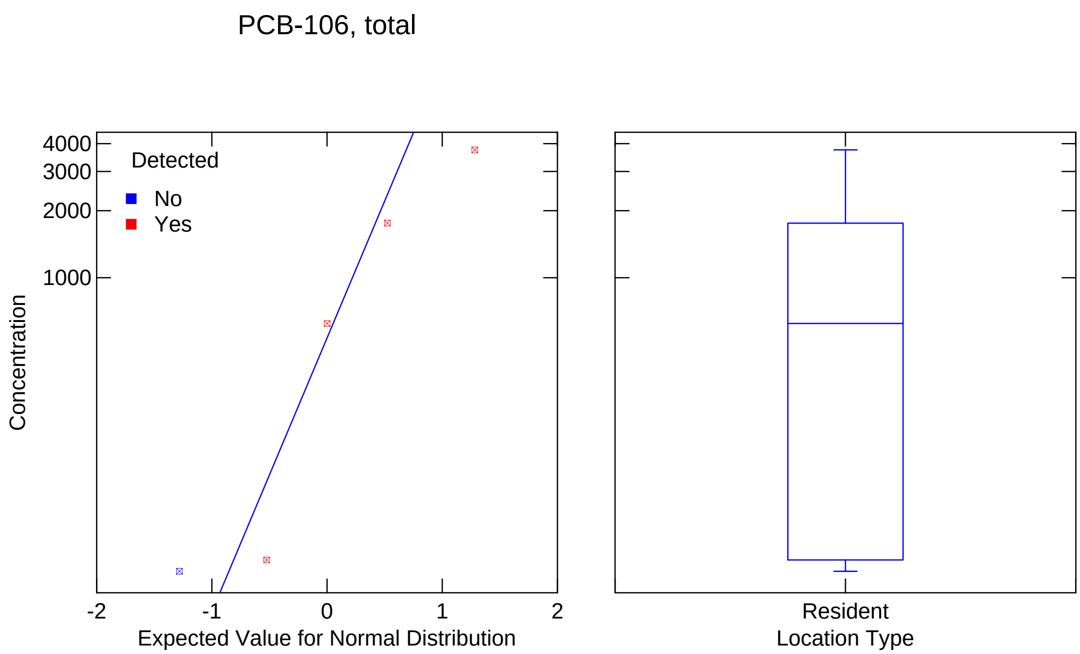

Lead, total
Concentration
150
100
50
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

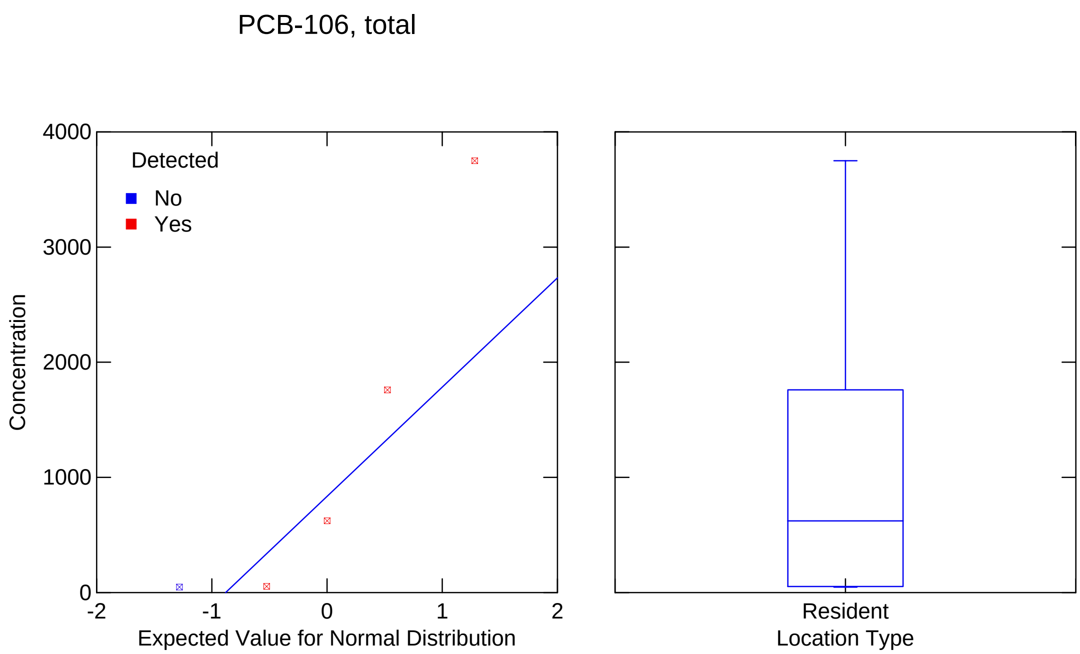

PCB-018, total
Detected
No
Yes
Concentration
10
100
1000
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

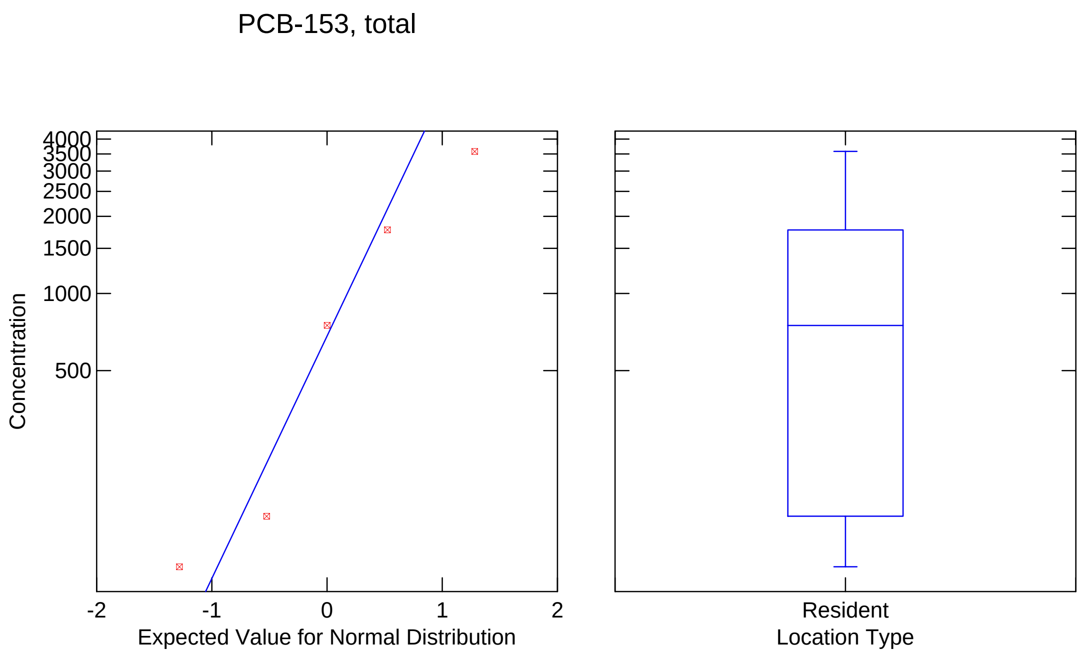

PCB-018, total
Detected
No
Yes
Concentration
0
1000
2000
3000
4000
5000
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

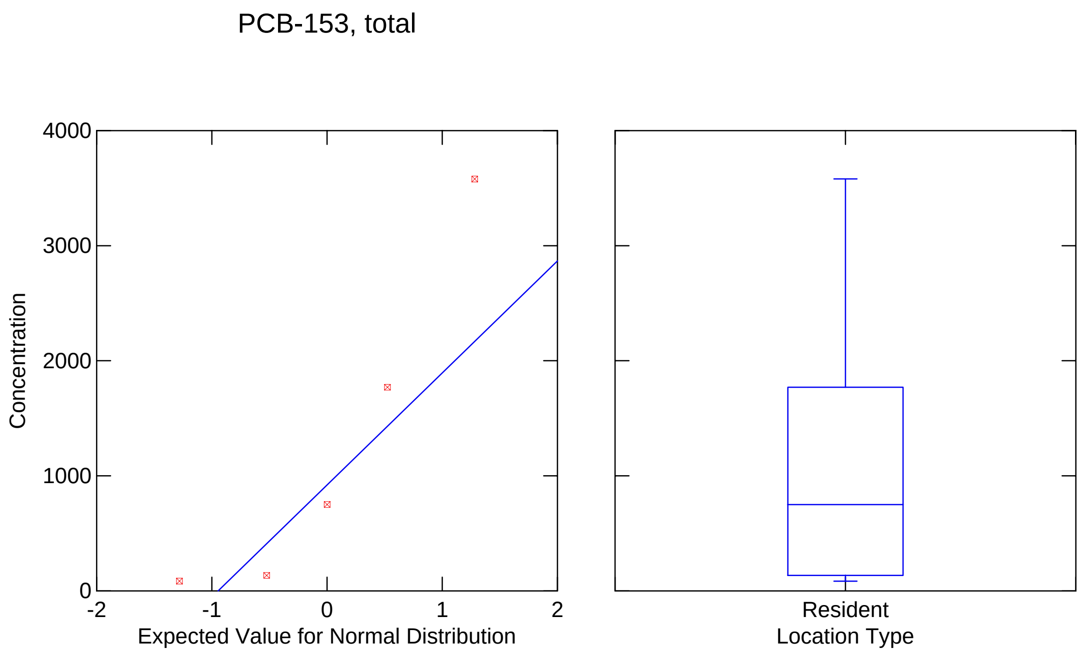

PCB-066, total
Detected
No
Yes
Concentration
1000
100
10
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type


PCB-066, total
Detected
No
Yes
Concentration
3000
2000
1000
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

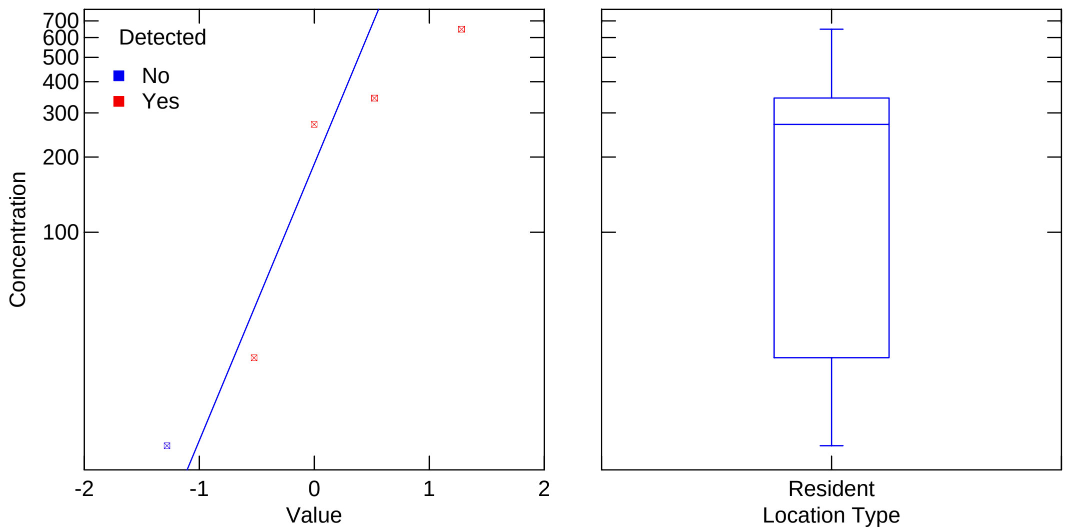

PCB-106, total
Concentration
4000
3000
2000
1000
Detected
No
Yes
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type


PCB-106, total
Concentration
4000
3000
2000
1000
0
Detected
No
Yes
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

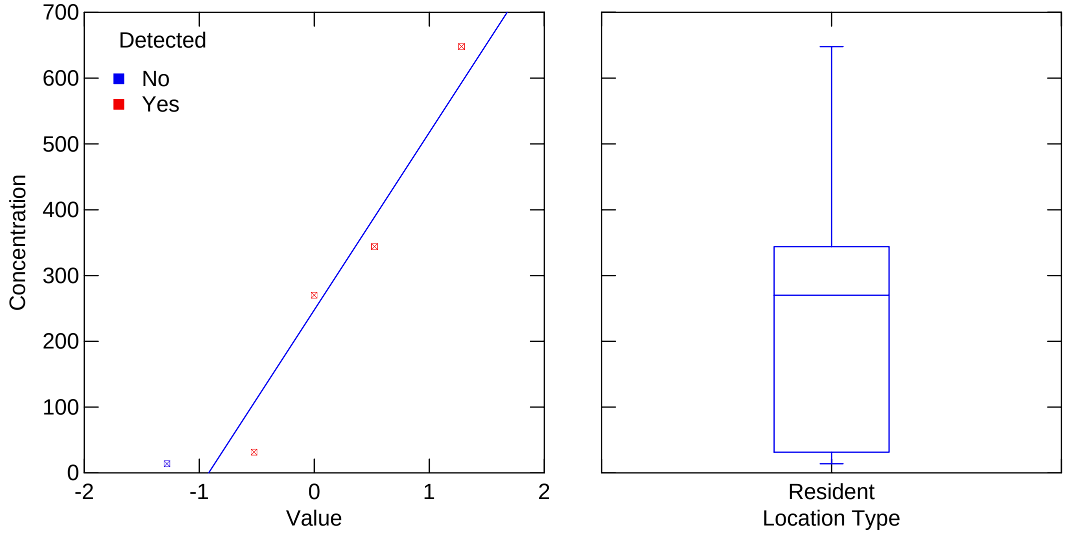

PCB-153, total
Concentration
4000
3500
3000
2500
2000
1500
1000
500
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type


PCB-153, total
Concentration
4000
3000
2000
1000
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

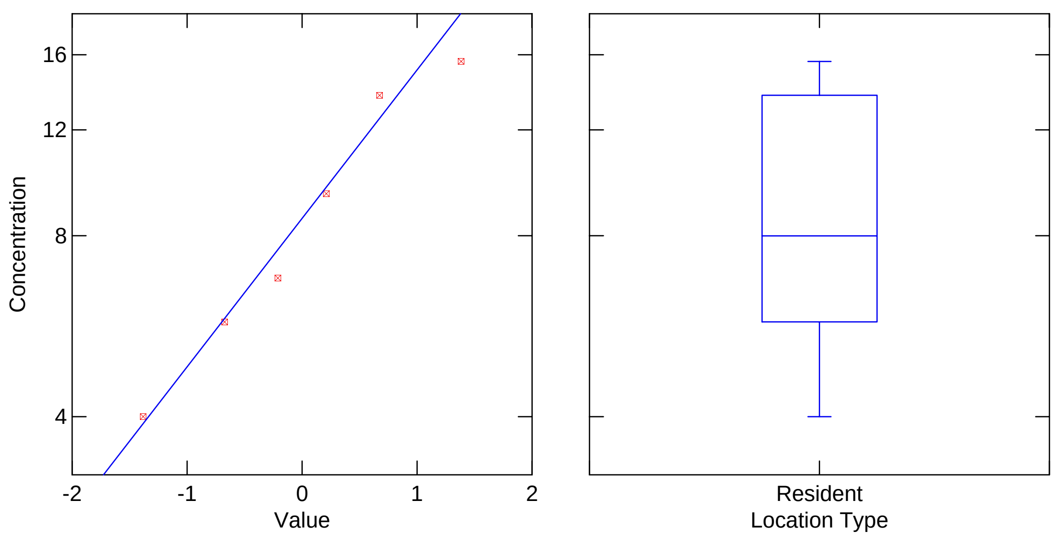
PCB-194, total



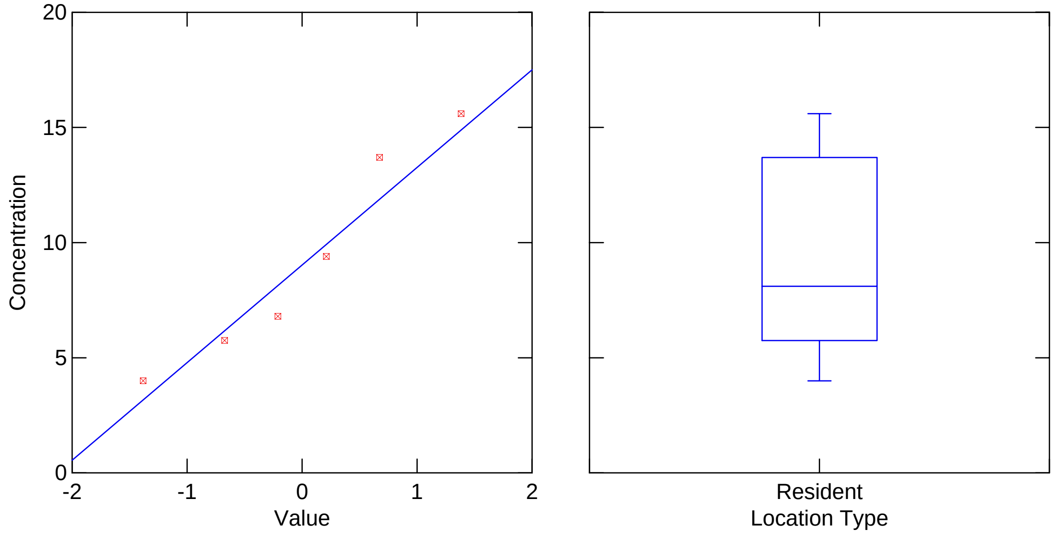
PCB-194, total



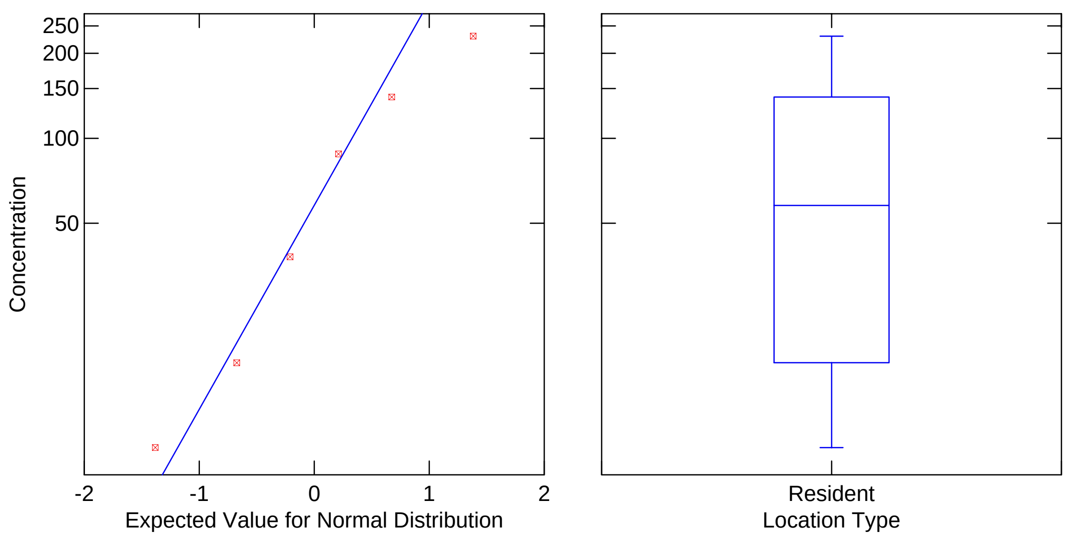
TOC

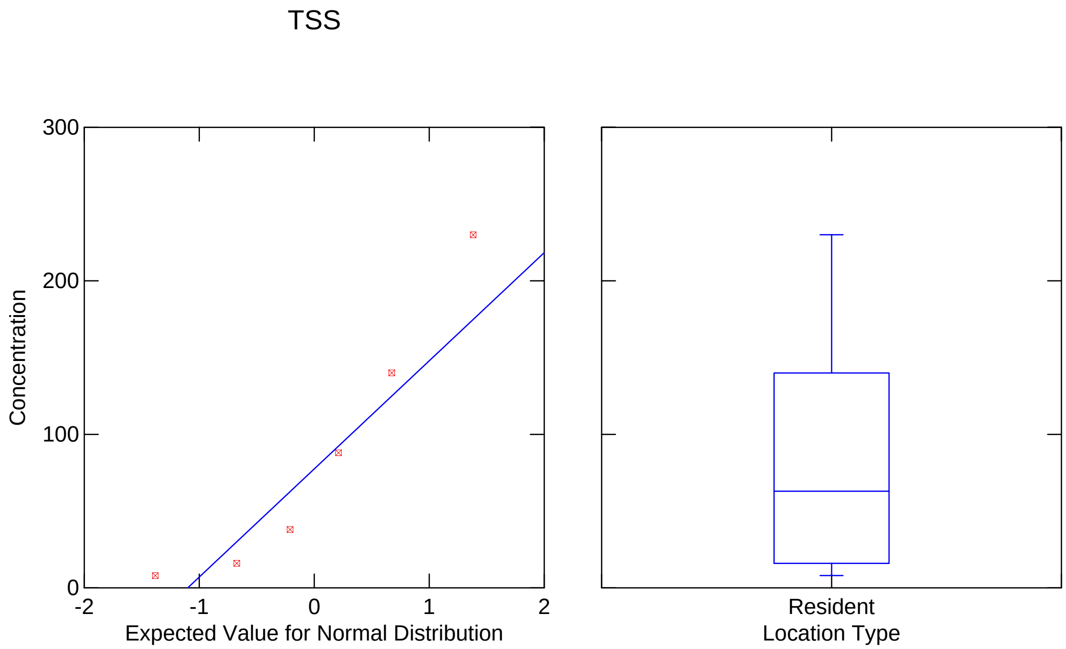


TOC


20
15
10
5
0
Concentration
-2
-1
0
1
2
Value
Resident
Location Type

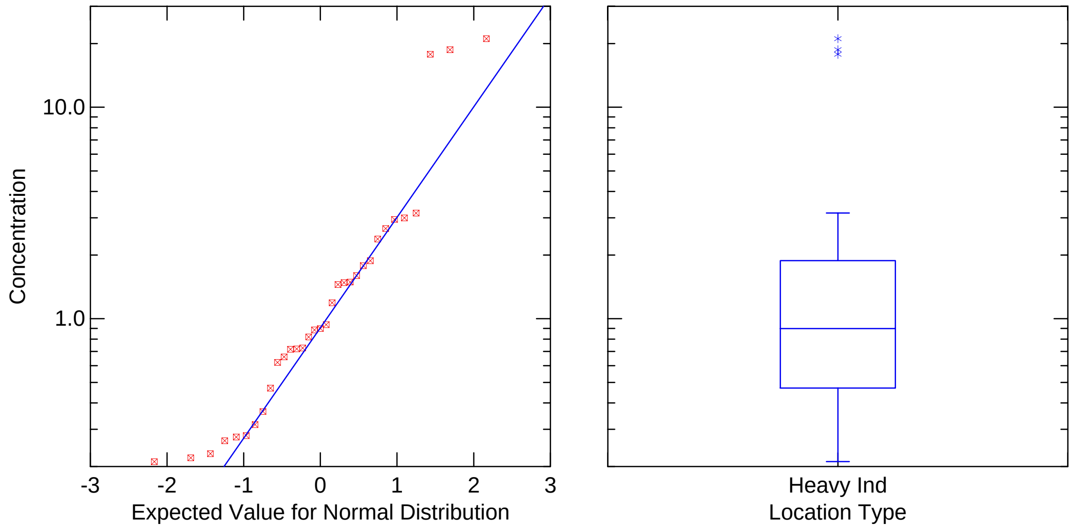
TSS


250
200
150
100
50
Concentration
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

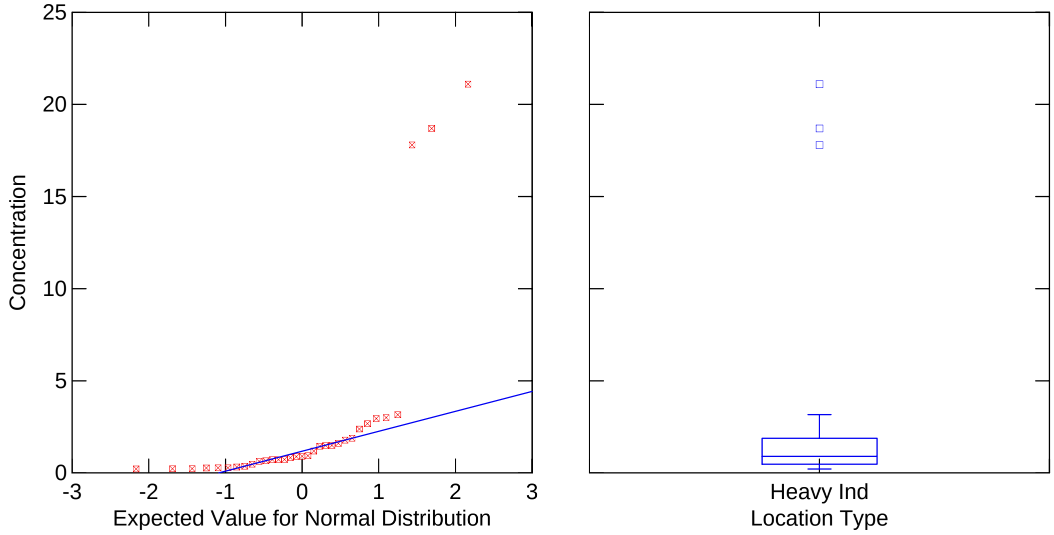

TSS
Concentration
300
200
100
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Resident
Location Type

RECLASSIFIED DATA - UNIQUE HEAVY INDUSTRIAL LOCATIONS

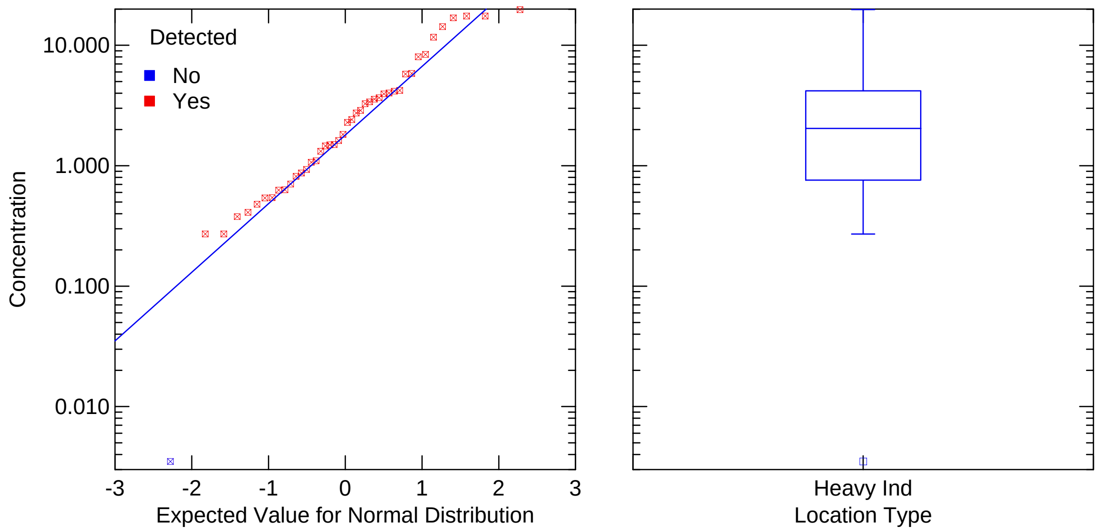
Arsenic, dissolved



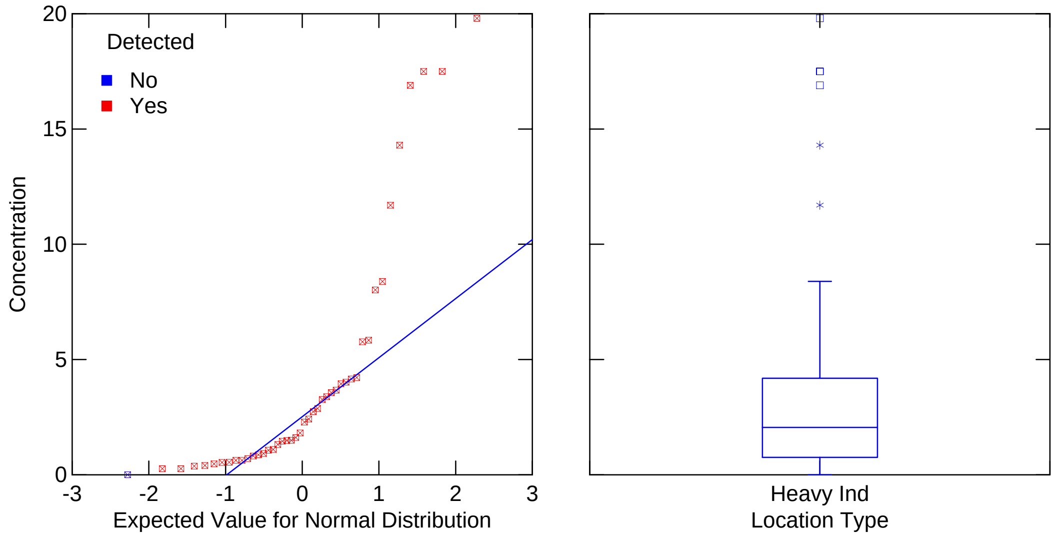
Arsenic, dissolved



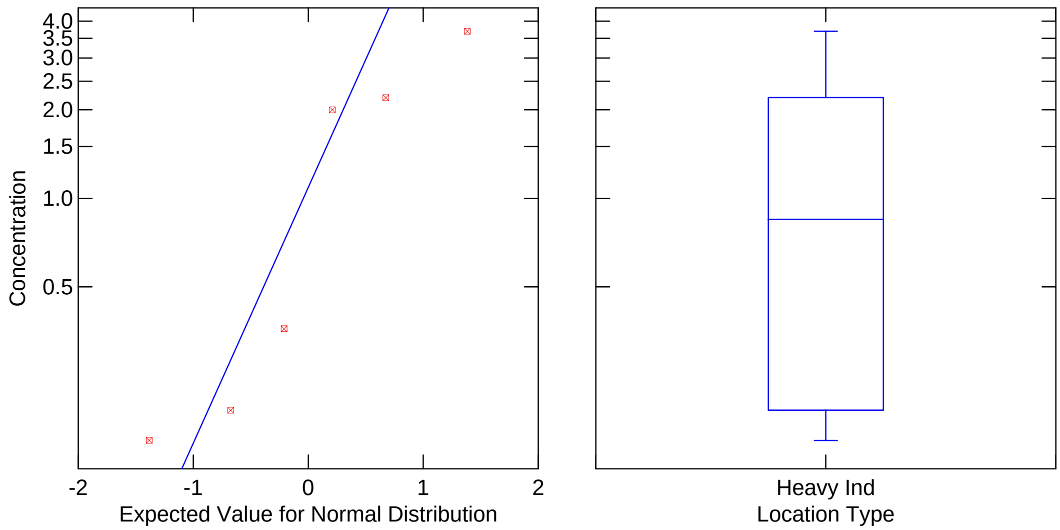
Arsenic, total



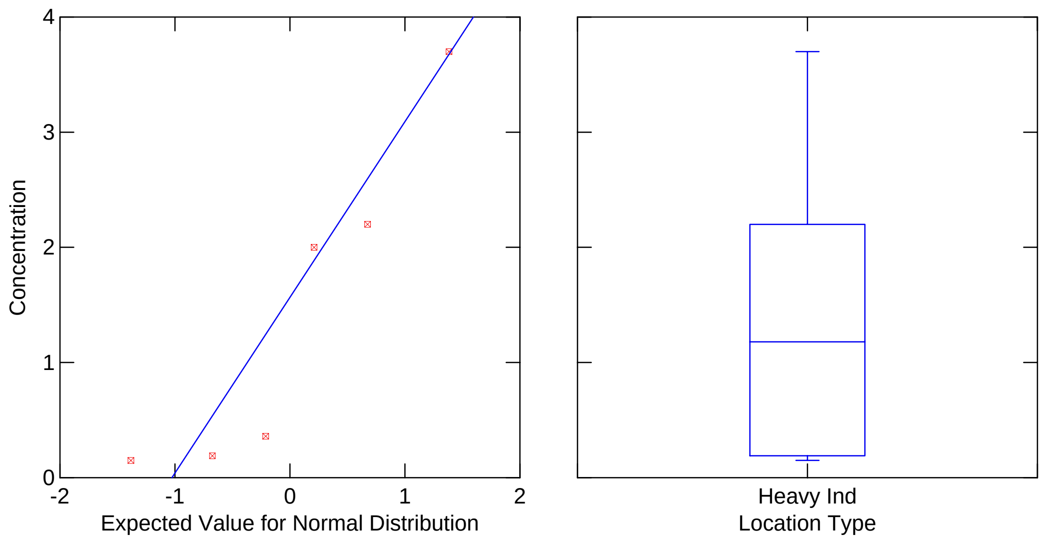
Arsenic, total

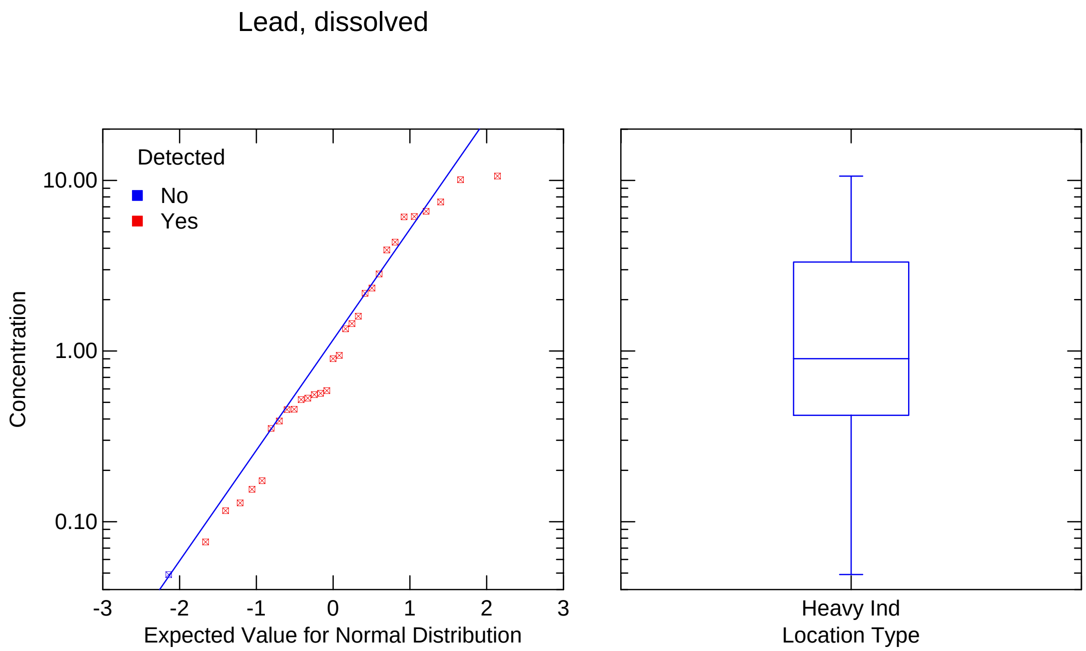


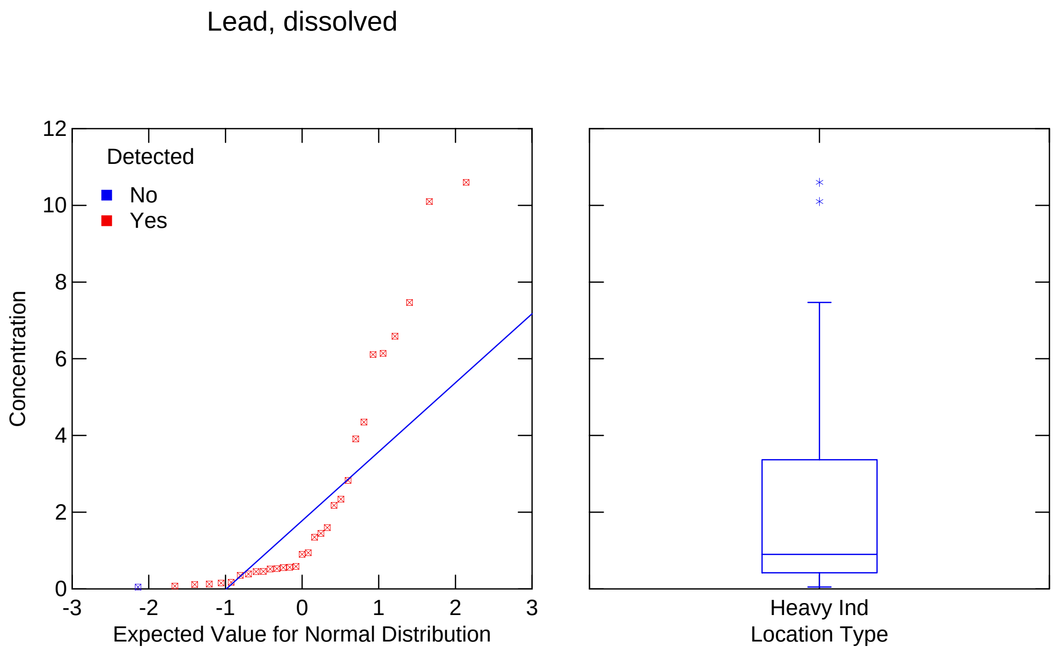
Benzo(a)pyrene, total



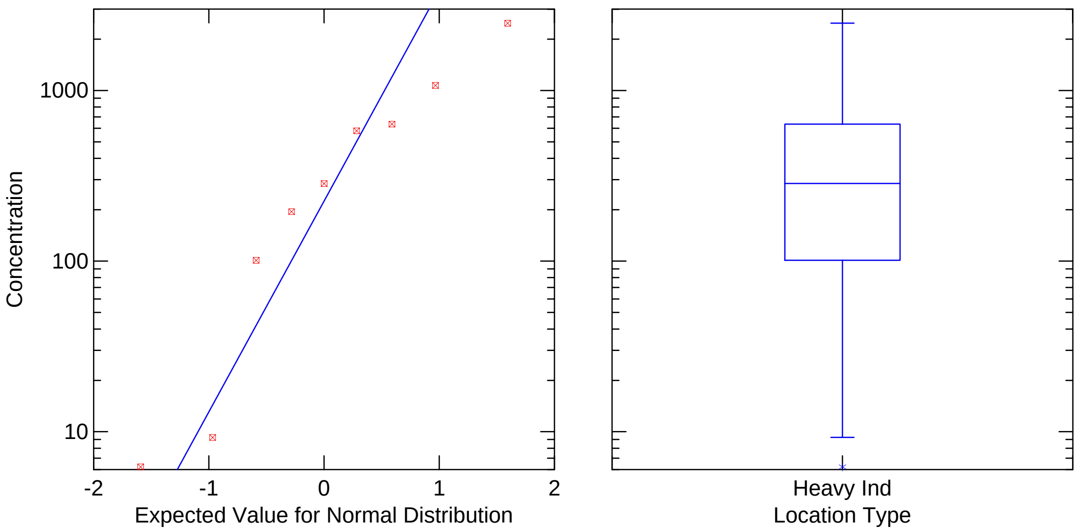
Benzo(a)pyrene, total



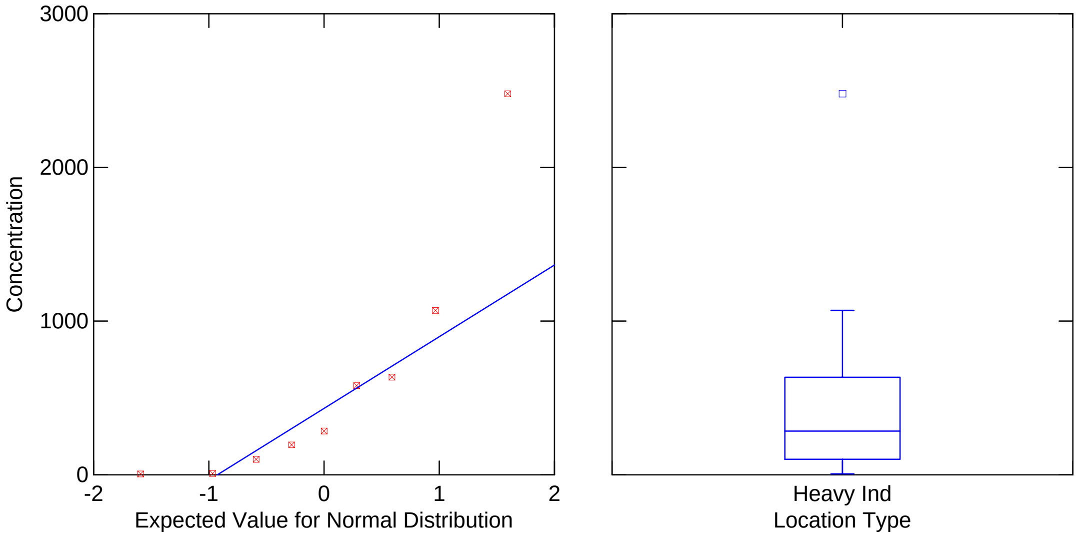

Lead, dissolved
Detected
No
Yes
10.00
1.00
0.10
Concentration
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type


Lead, dissolved
Detected
No
Yes
12
10
8
6
4
2
0
Concentration
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

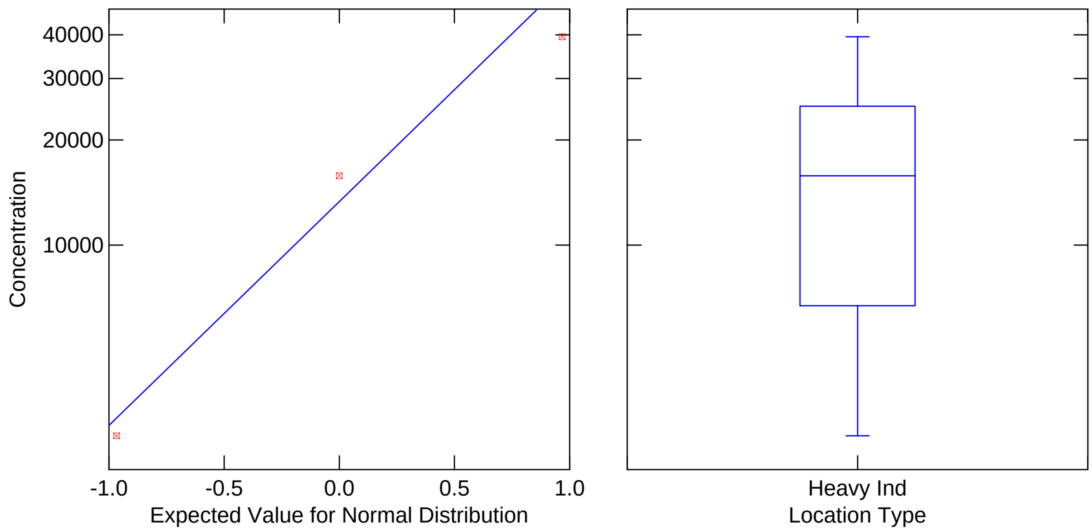
Lead, total



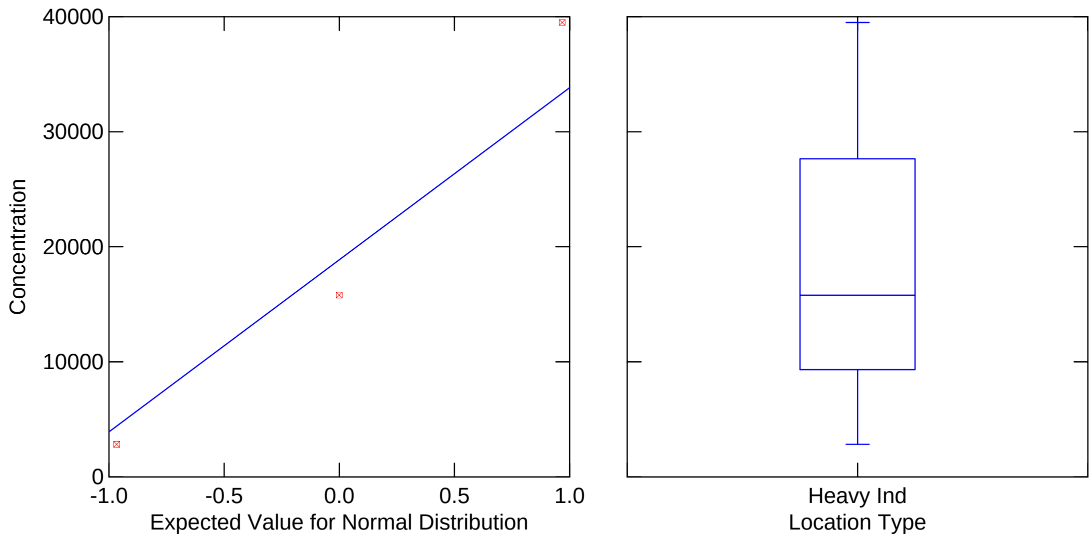
Lead, total

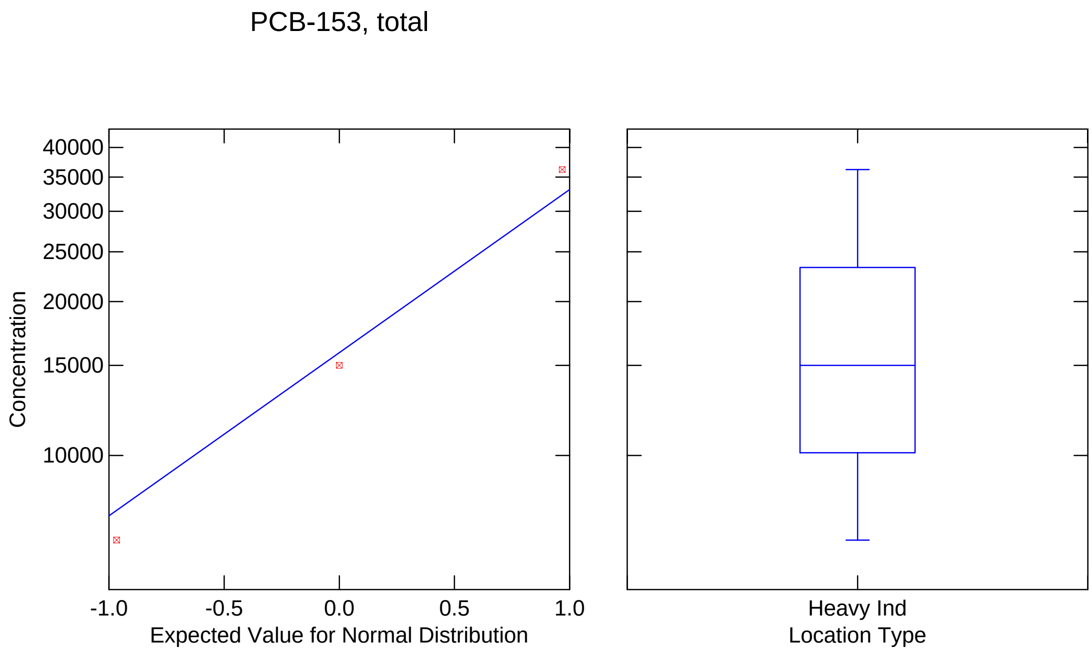


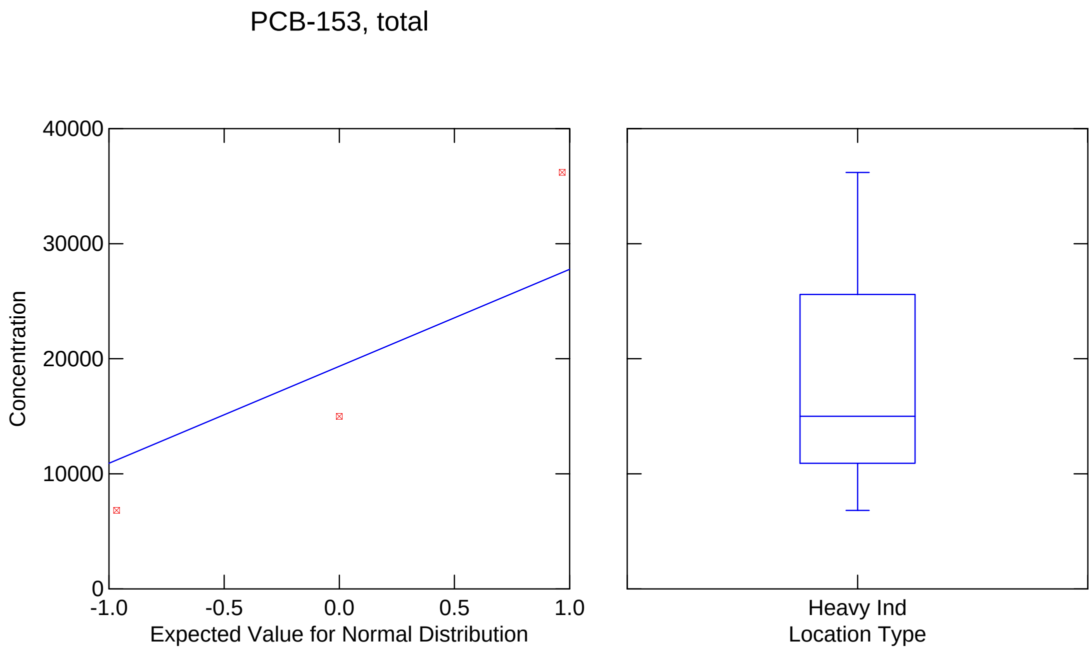
PCB-106, total



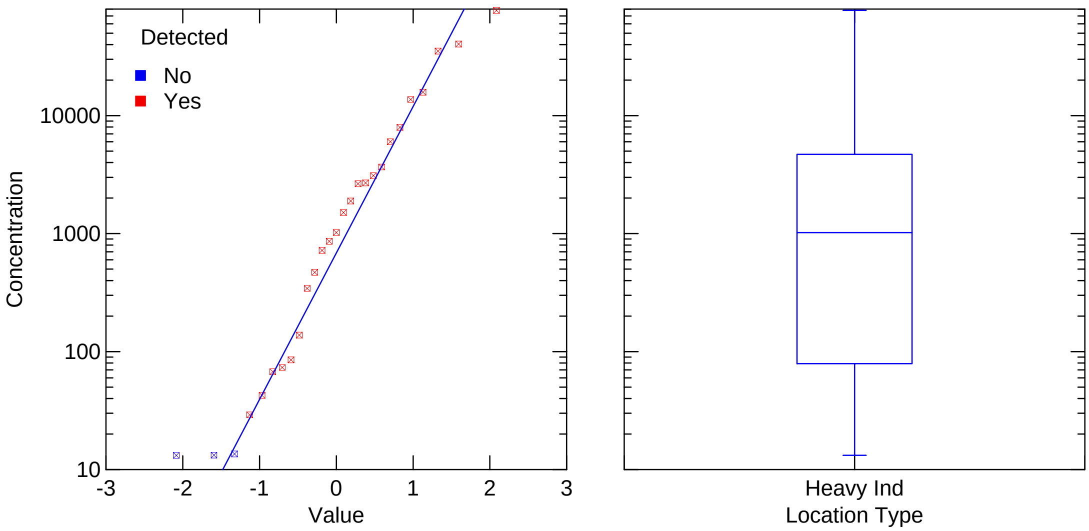
PCB-106, total



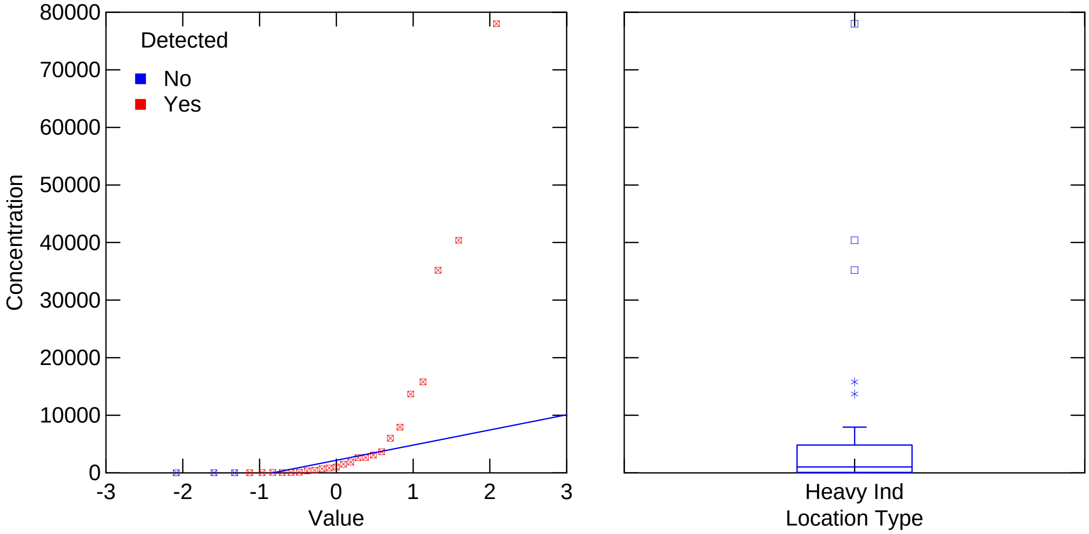

PCB-153, total
Concentration
40000
35000
30000
25000
20000
15000
10000
-1.0
-0.5
0.0
0.5
1.0
Expected Value for Normal Distribution
Heavy Ind
Location Type

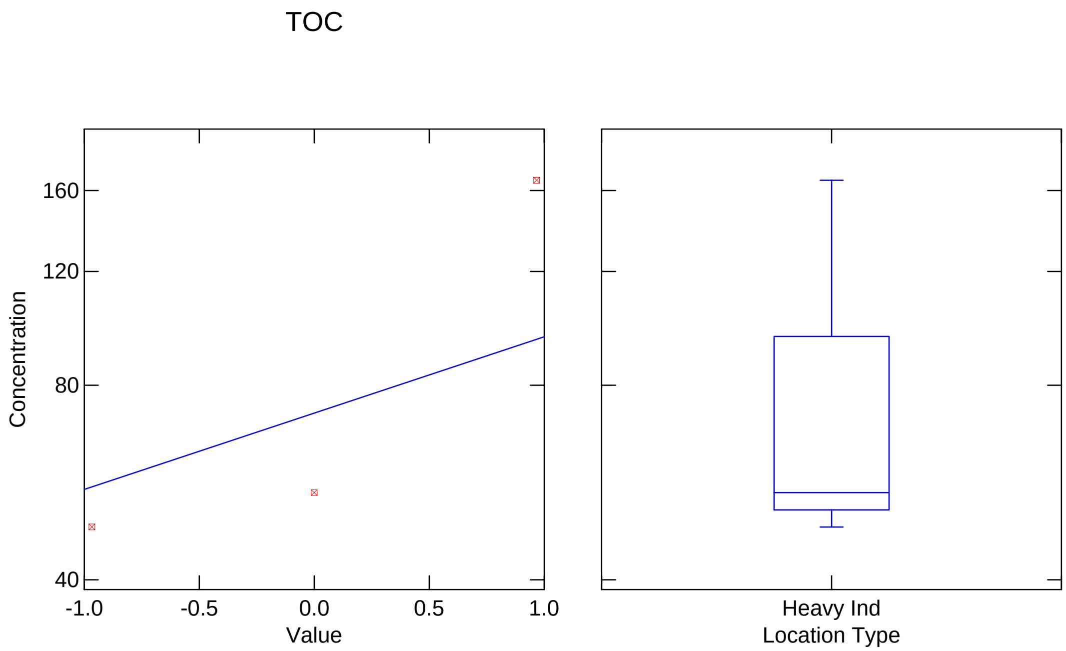

PCB-153, total
Concentration
40000
30000
20000
10000
0
-1.0
-0.5
0.0
0.5
1.0
Expected Value for Normal Distribution
Heavy Ind
Location Type

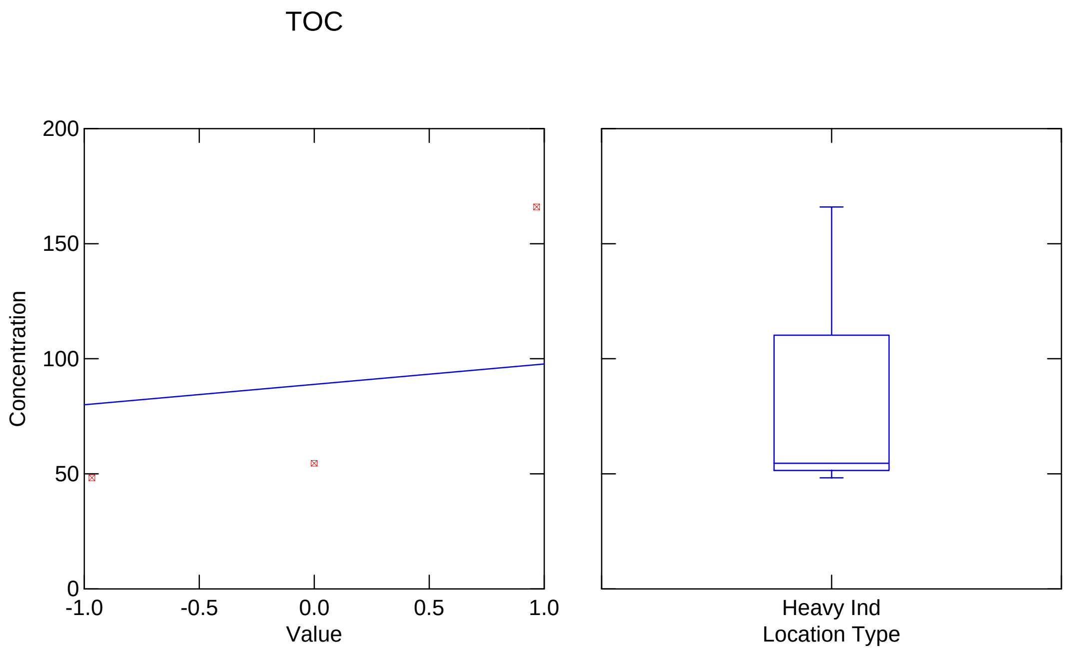
PCB-194, total



PCB-194, total

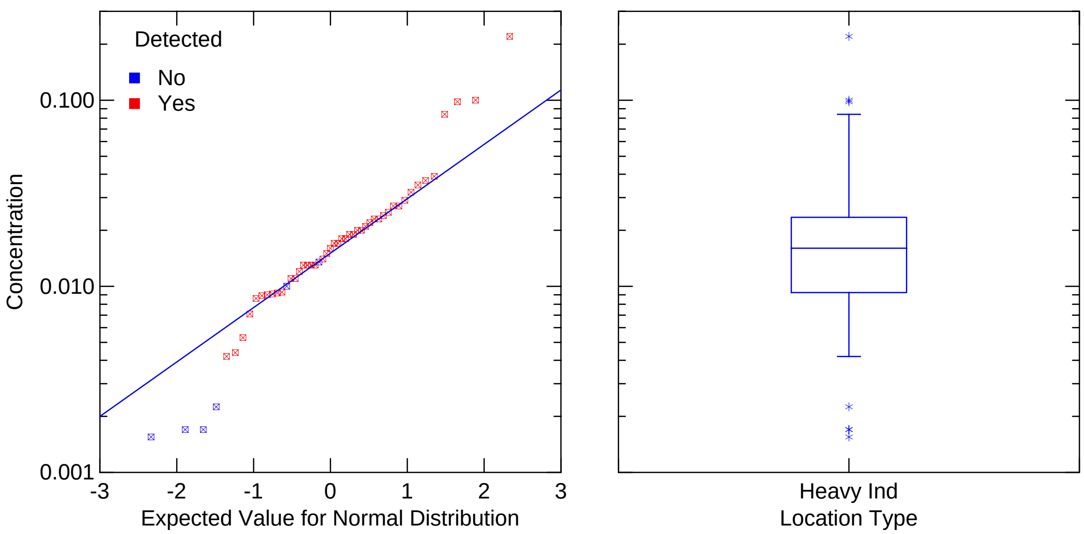



TOC
Concentration
160
120
80
40
-1.0
-0.5
0.0
0.5
1.0
Value
Heavy Ind
Location Type

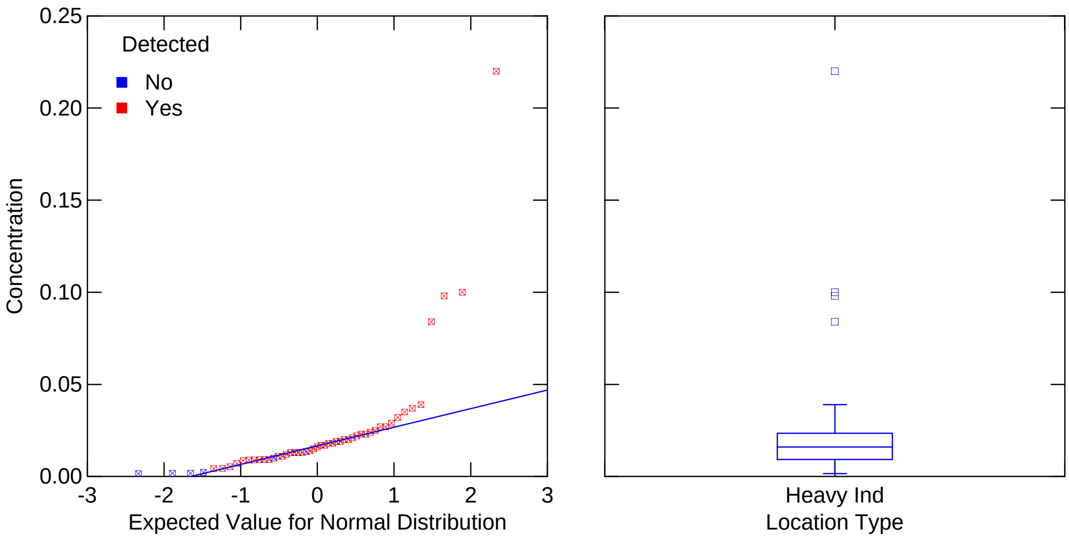

TOC
Concentration
200
150
100
50
0
-1.0
-0.5
0.0
0.5
1.0
Value
Heavy Ind
Location Type

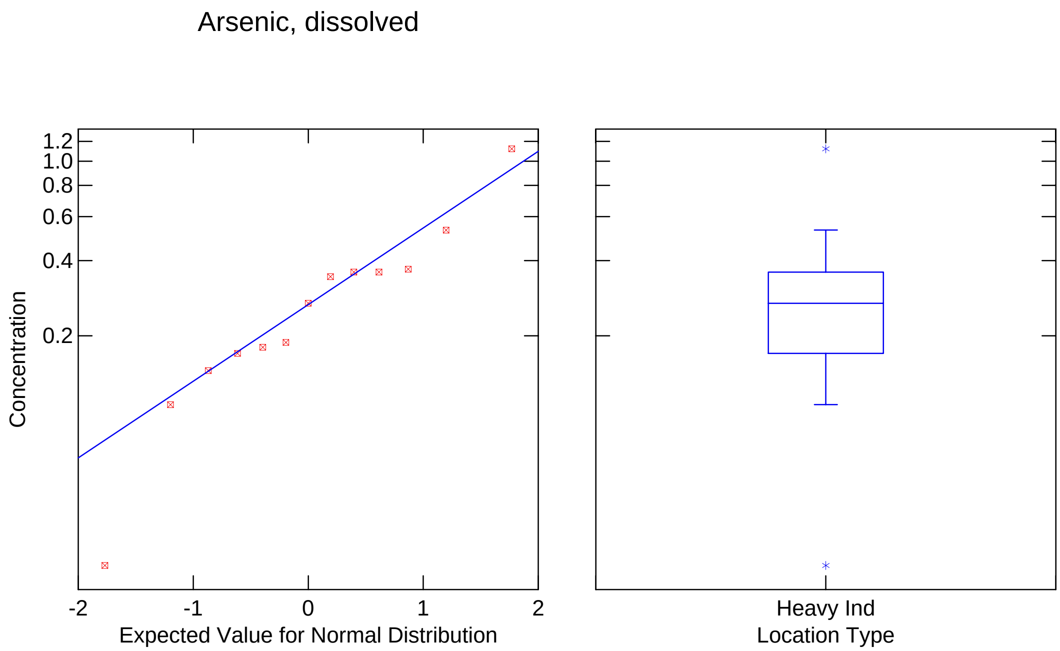
RECLASSIFIED DATA - REPRESENTATIVE HEAVY INDUSTRIAL LOCATIONS

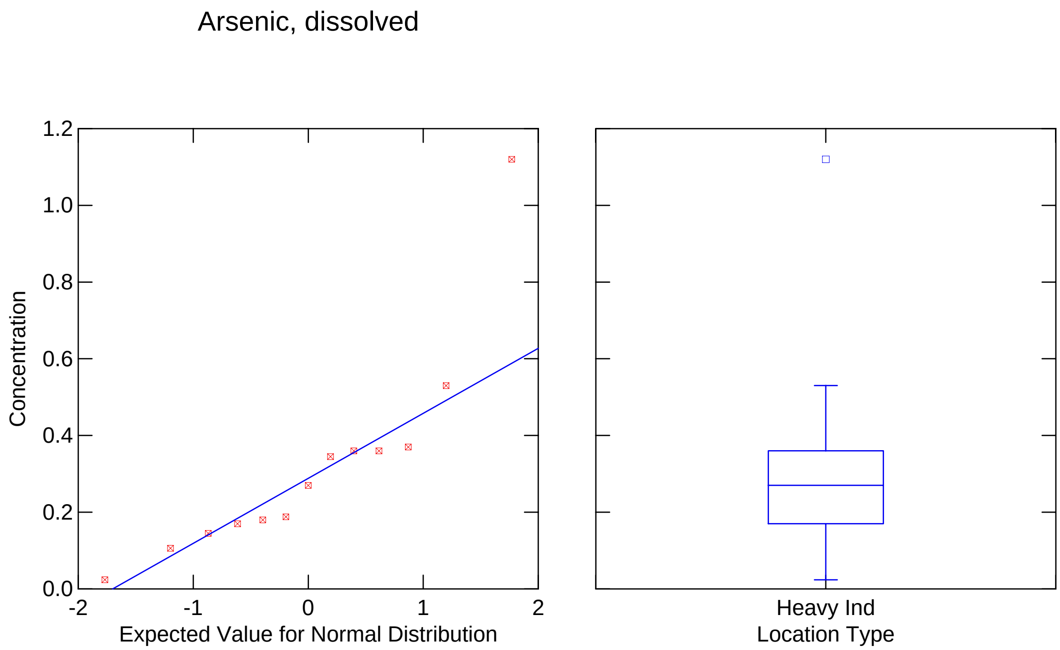
Acenaphythlene, Total

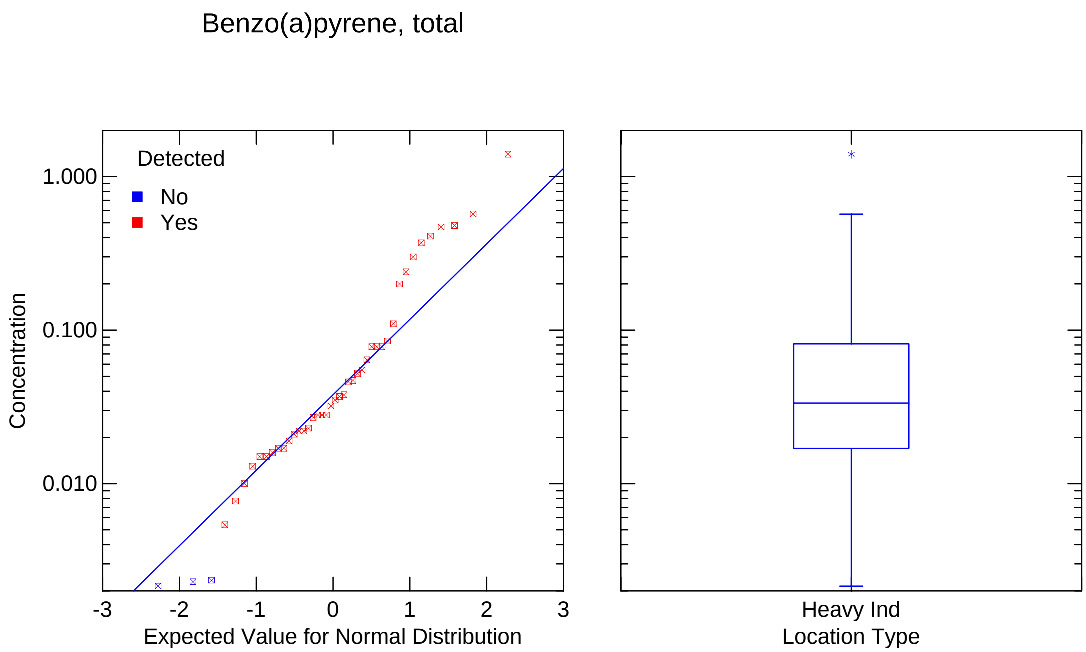


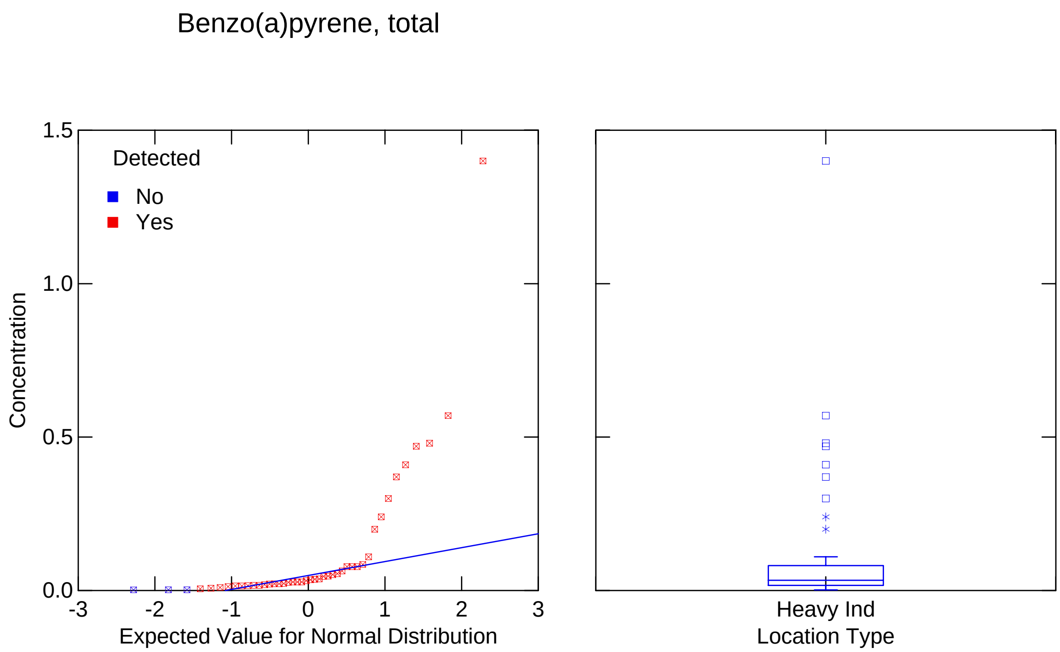
Acenaphythlene, Total



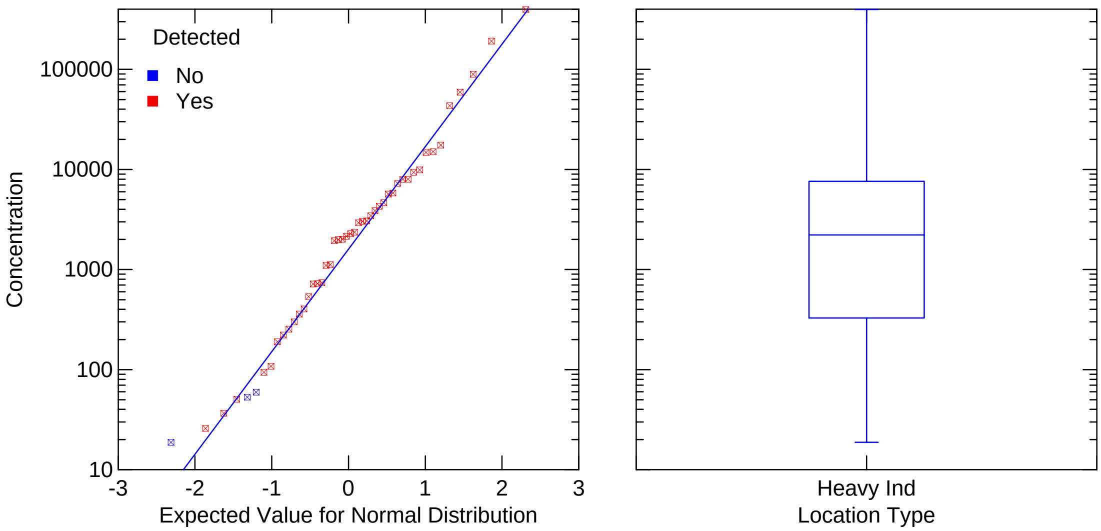

Arsenic, dissolved
Concentration
1.2
1.0
0.8
0.6
0.4
0.2
-2
-1
0
1
2
Expected Value for Normal Distribution
Heavy Ind
Location Type


Arsenic, dissolved
Concentration
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-2
-1
0
1
2
Expected Value for Normal Distribution
Heavy Ind
Location Type

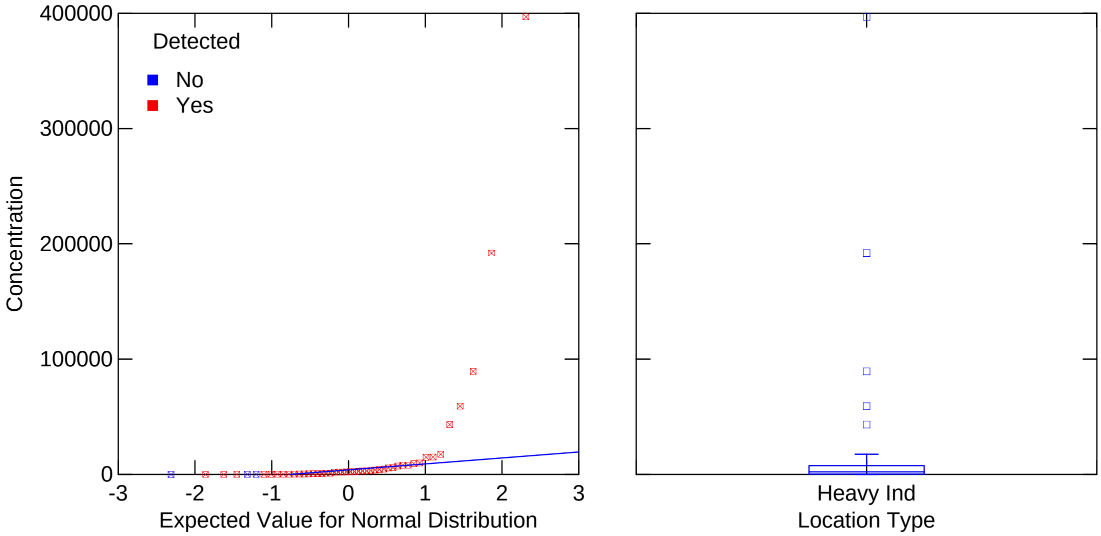

Benzo(a)pyrene, total
Detected
No
Yes
Concentration
1.000
0.100
0.010
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type


Benzo(a)pyrene, total
Detected
No
Yes
Concentration
1.5
1.0
0.5
0.0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

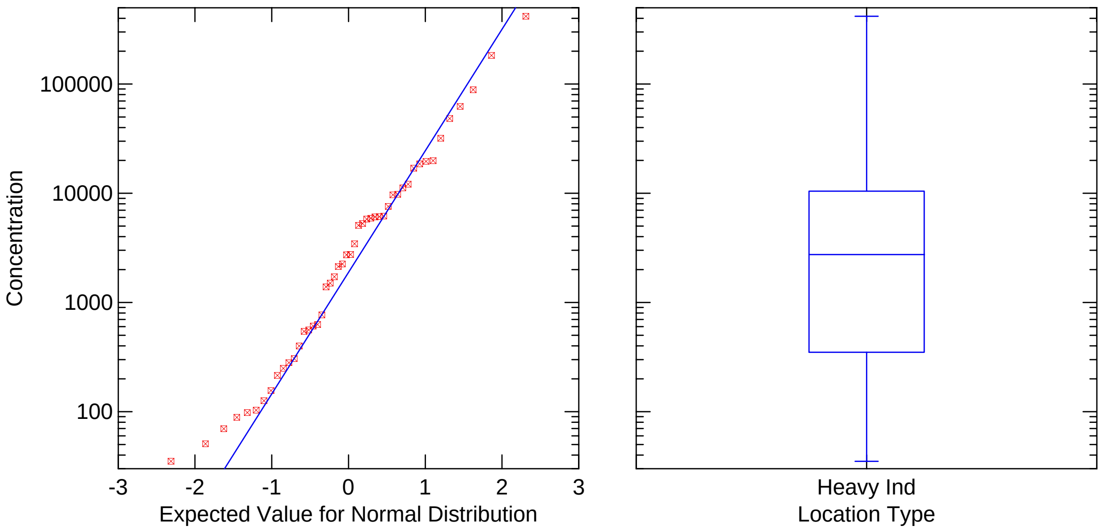
PCB-106, total



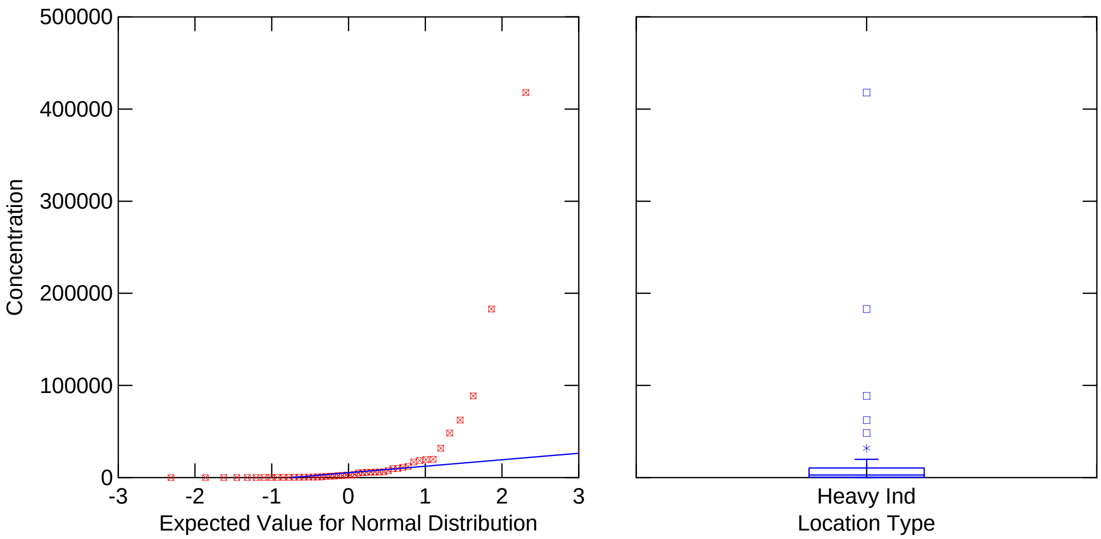
PCB-106, total



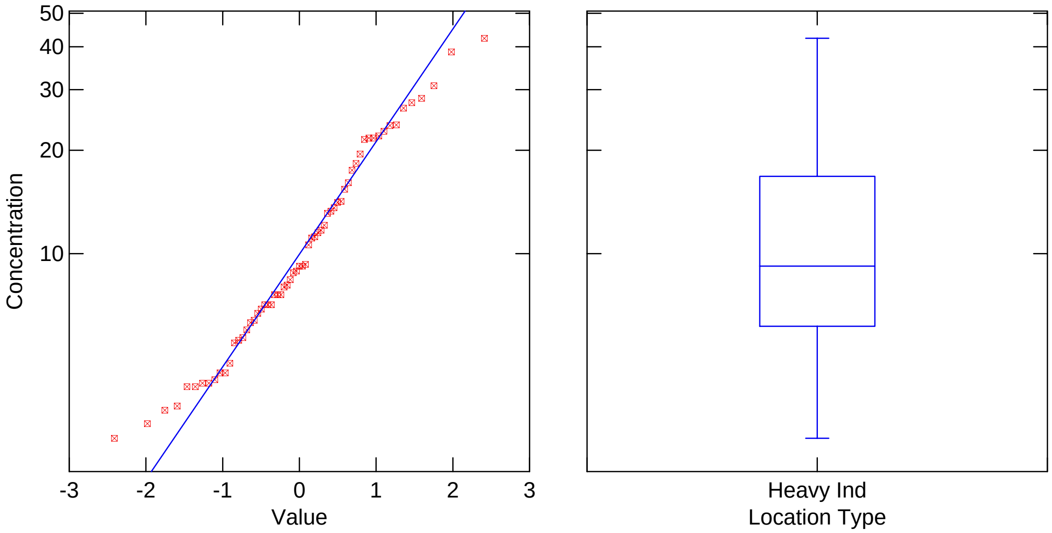
PCB-153, total



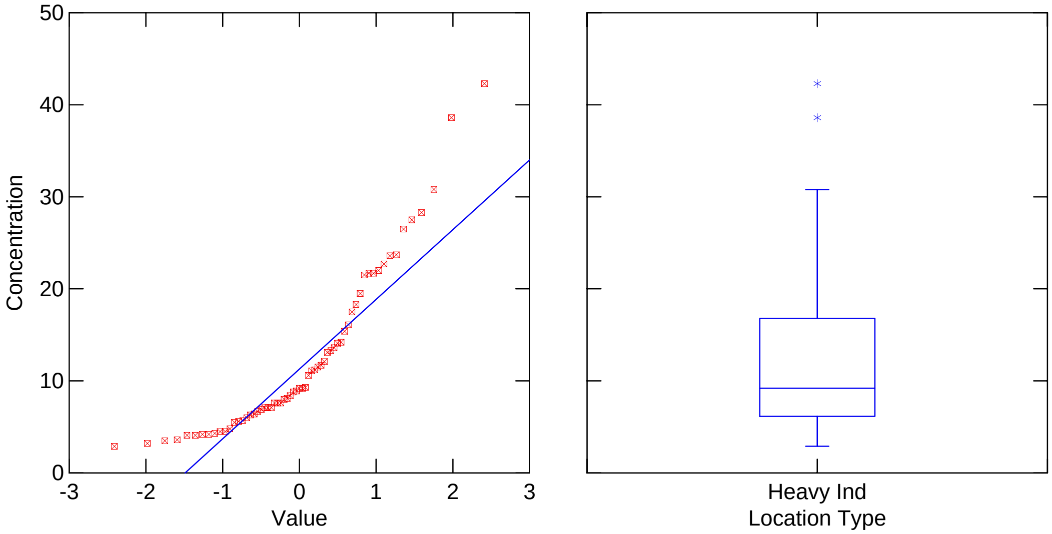
PCB-153, total

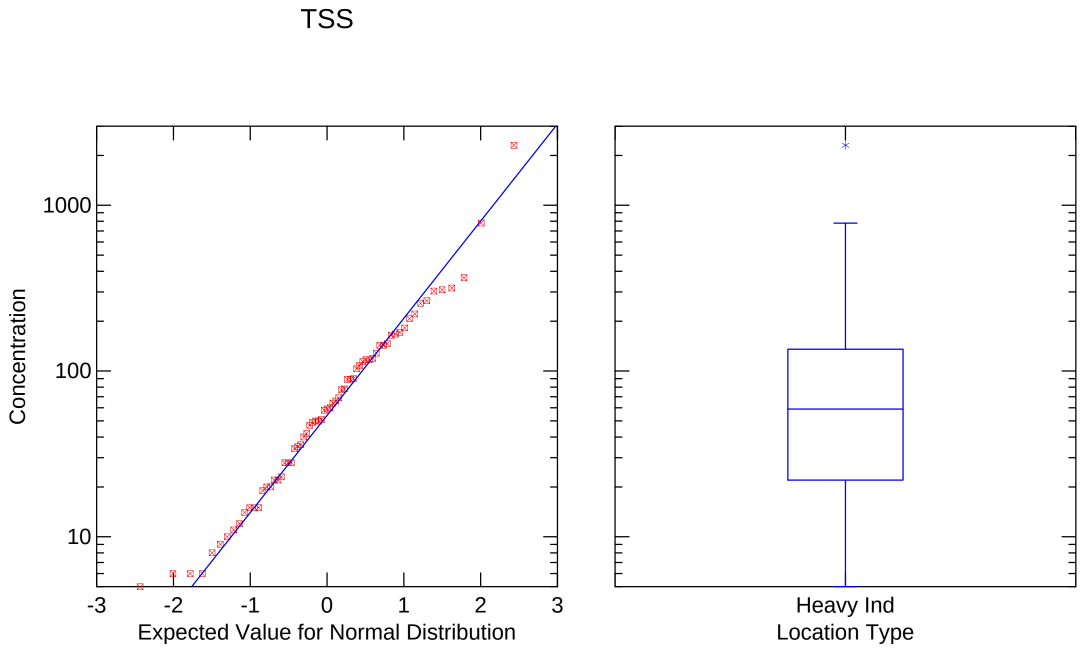


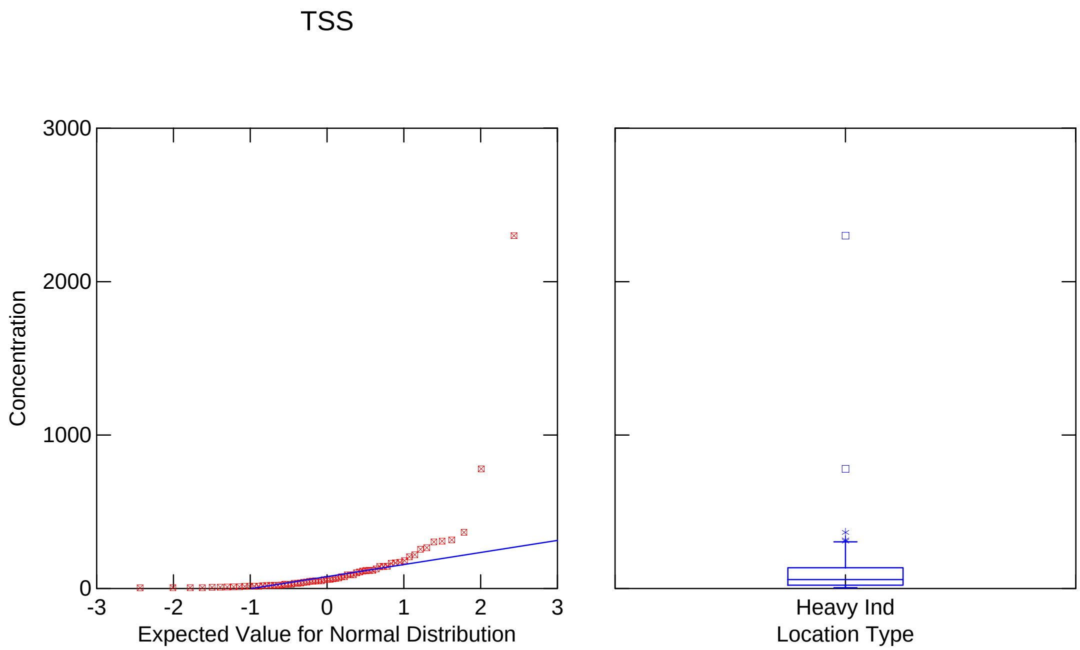
TOC


50
40
30
20
10
Concentration
-3
-2
-1
0
1
2
3
Value
Heavy Ind
Location Type

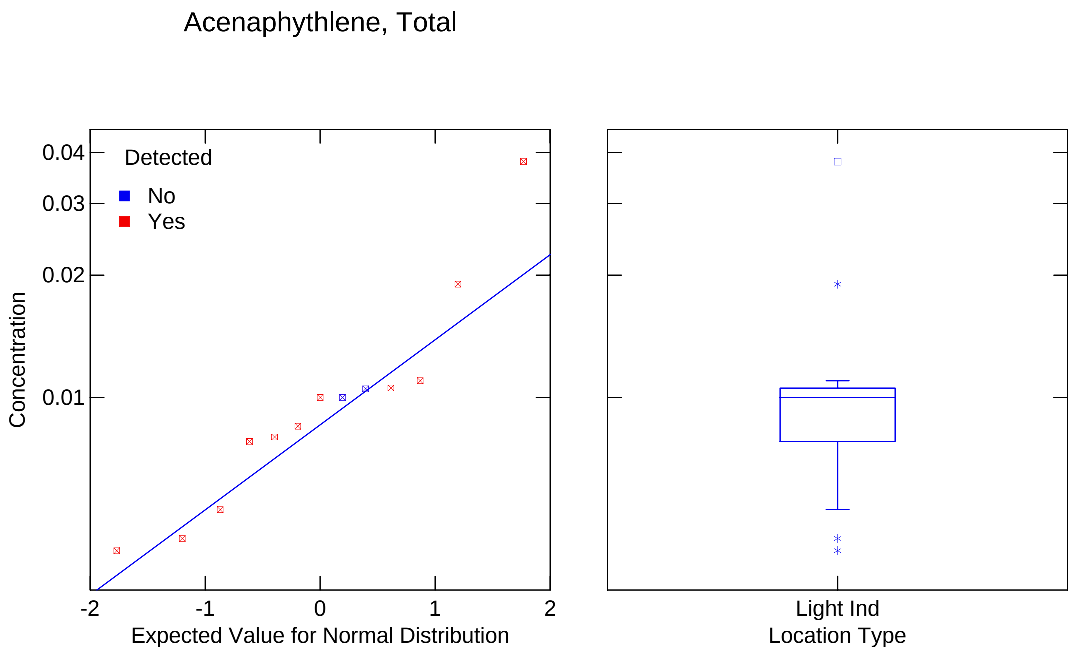
TOC

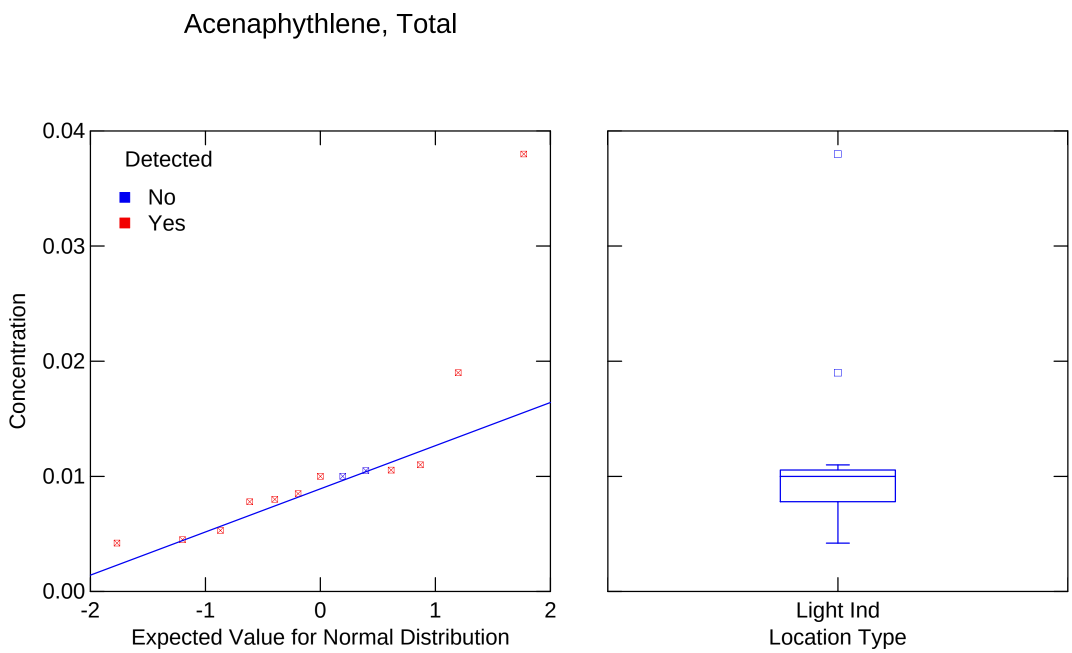

50
40
30
20
10
0
Concentration
-3
-2
-1
0
1
2
3
Value
Heavy Ind
Location Type

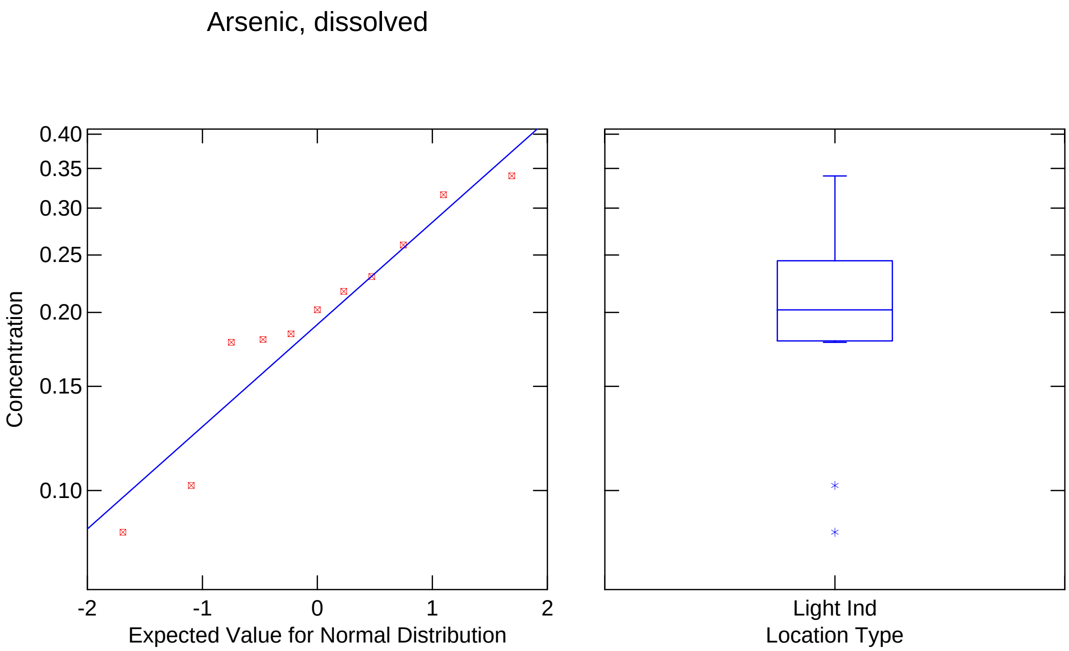

TSS
Concentration
1000
100
10
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

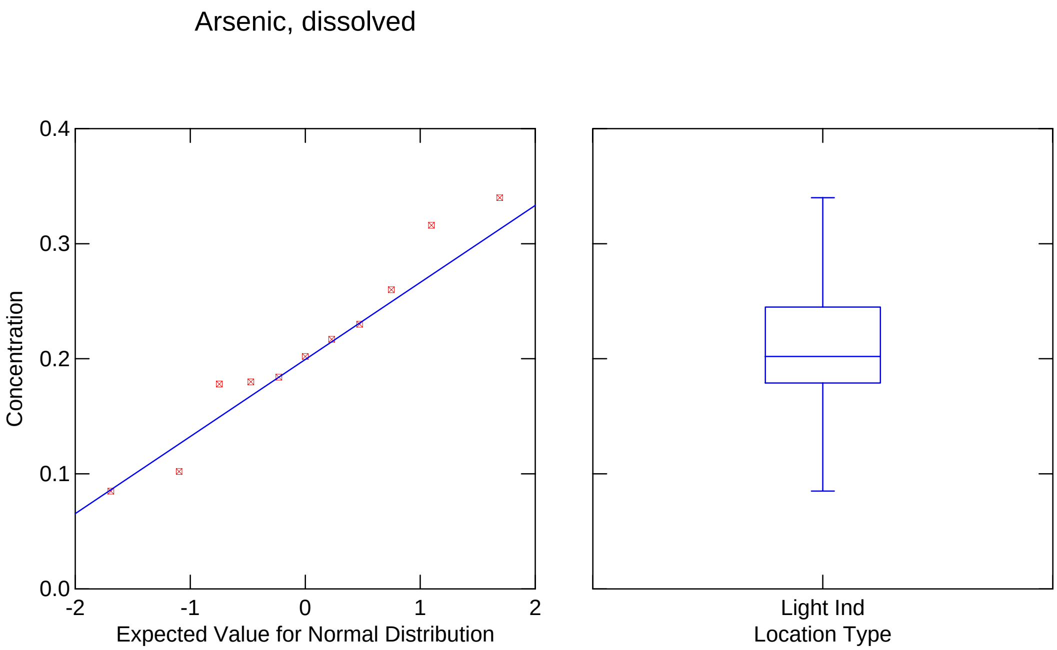

TSS
Concentration
3000
2000
1000
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Heavy Ind
Location Type

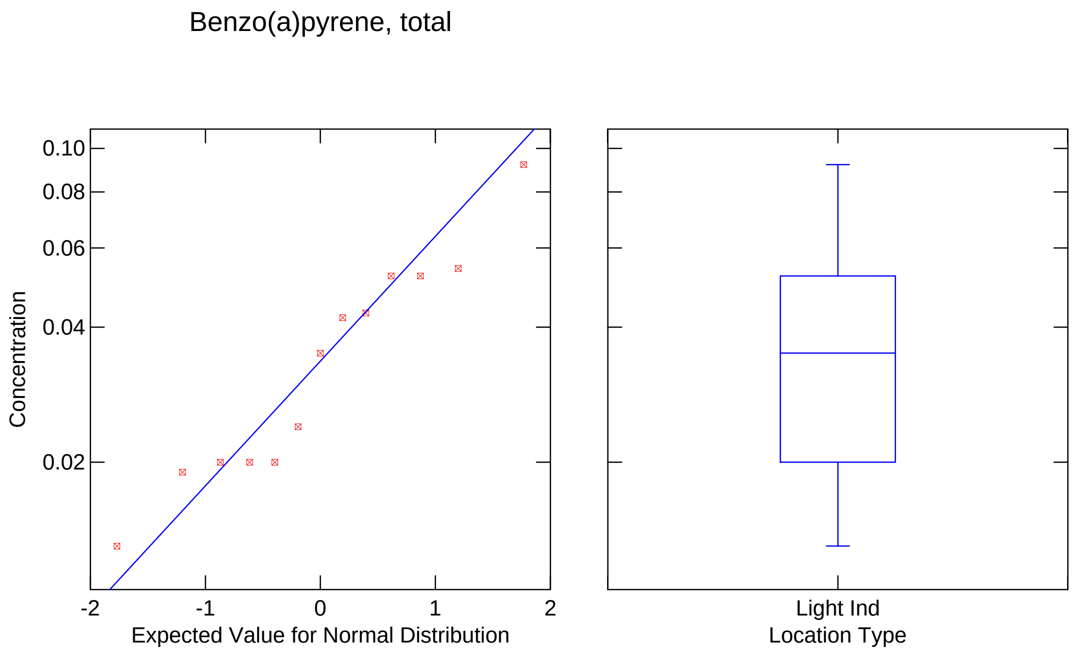
RECLASSIFIED DATA - REPRESENTATIVE LIGHT INDUSTRIAL LOCATIONS

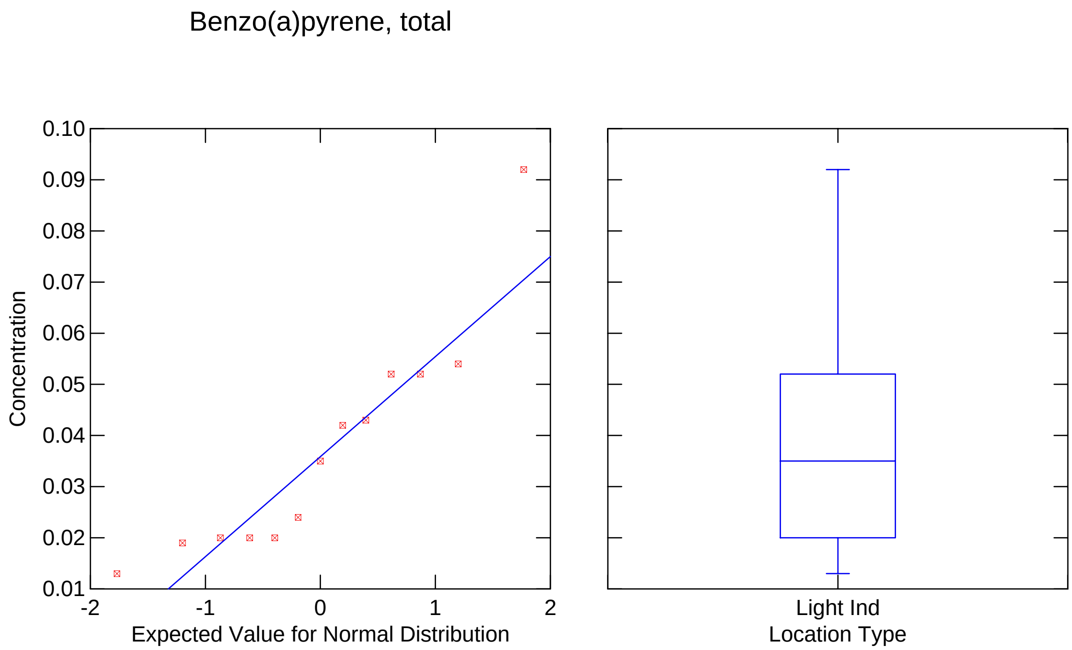


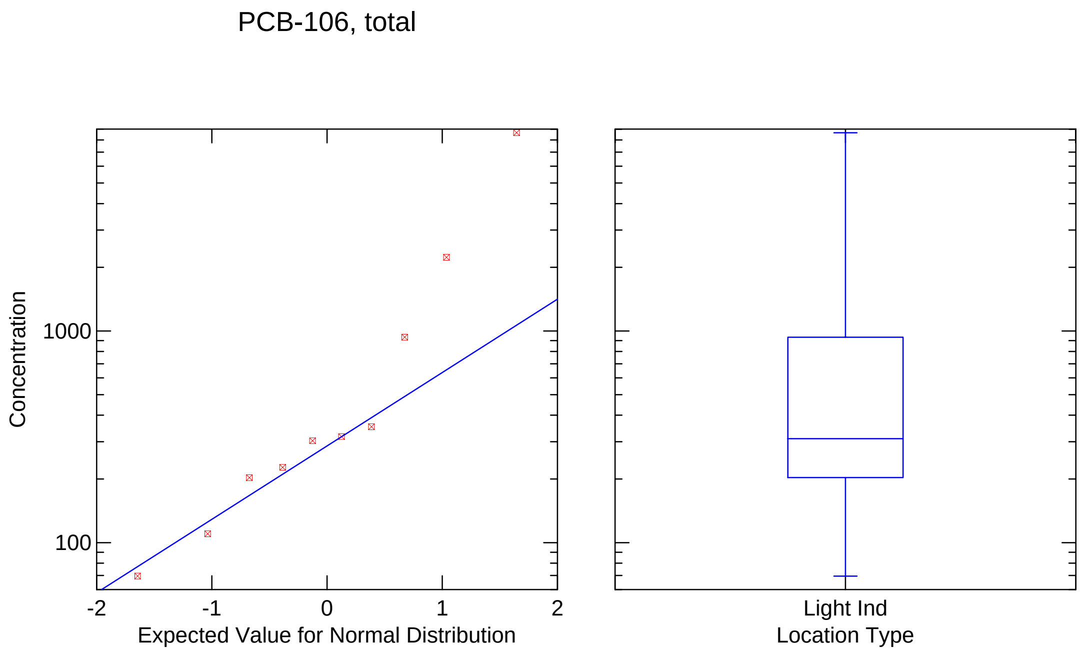


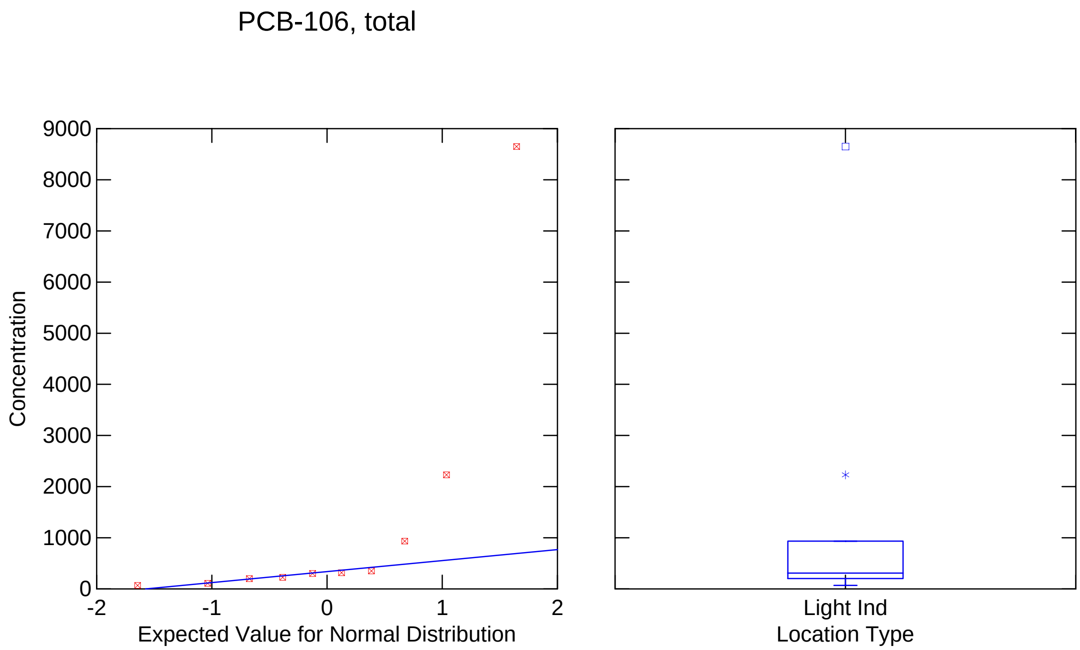

Arsenic, dissolved
Concentration
0.40
0.35
0.30
0.25
0.20
0.15
0.10
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

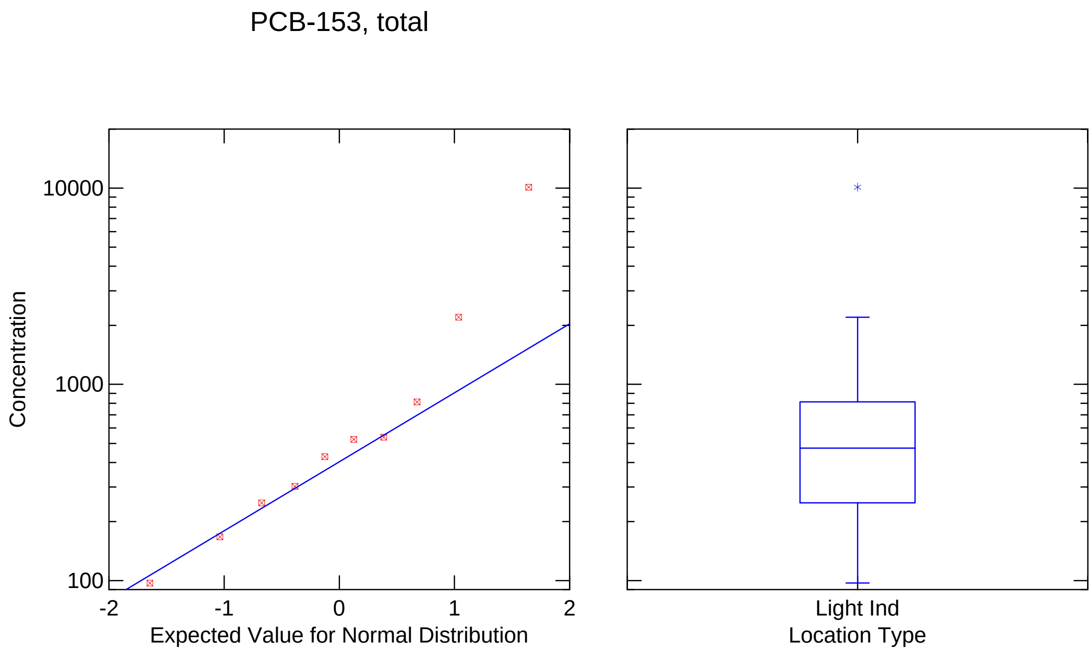

Arsenic, dissolved
Concentration
0.4
0.3
0.2
0.1
0.0
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

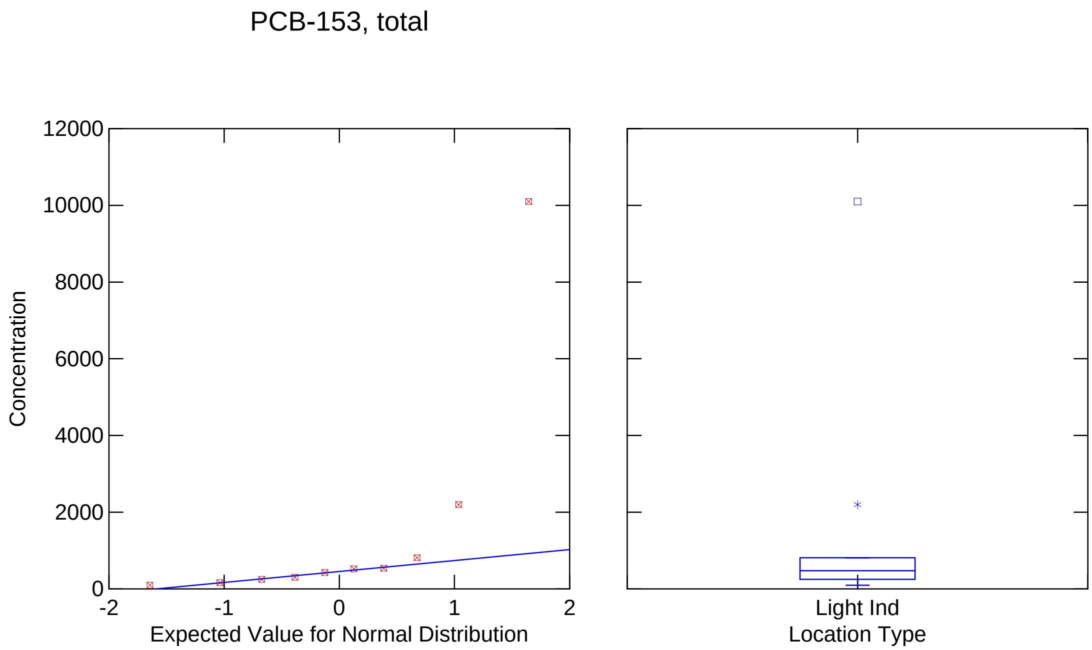

Benzo(a)pyrene, total
Concentration
0.10
0.08
0.06
0.04
0.02
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type


Benzo(a)pyrene, total
Concentration
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

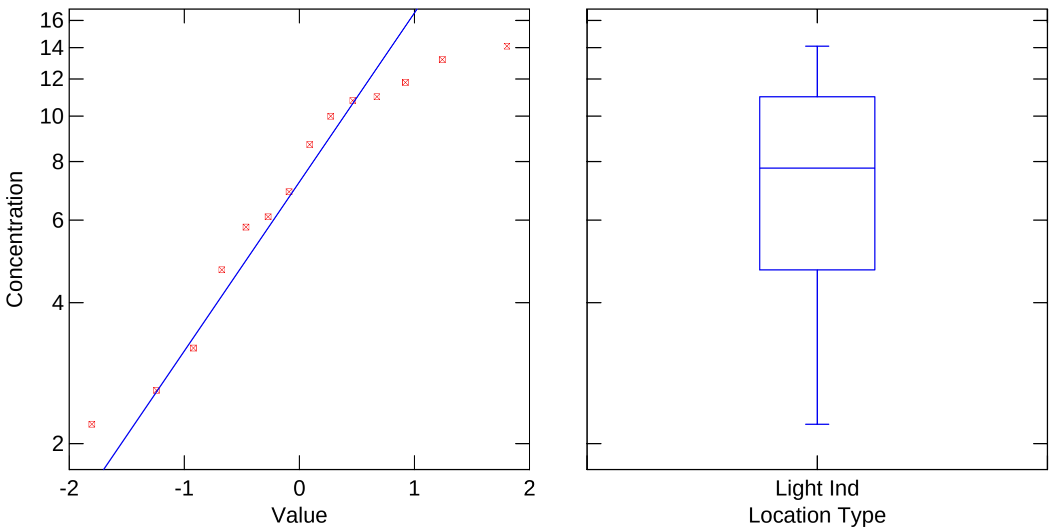

PCB-106, total
Concentration
1000
100
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type


PCB-106, total
Concentration
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

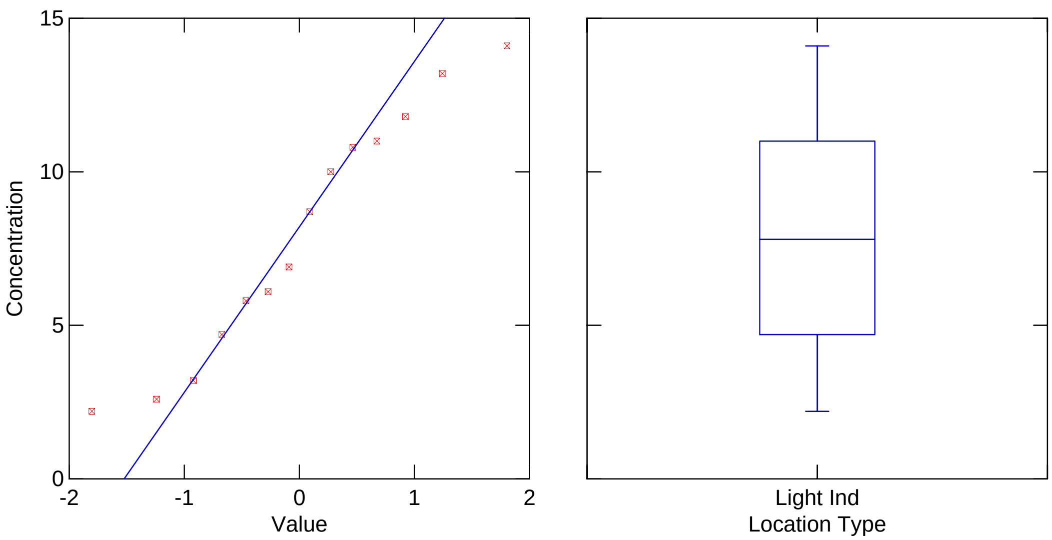

PCB-153, total
Concentration
10000
1000
100
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

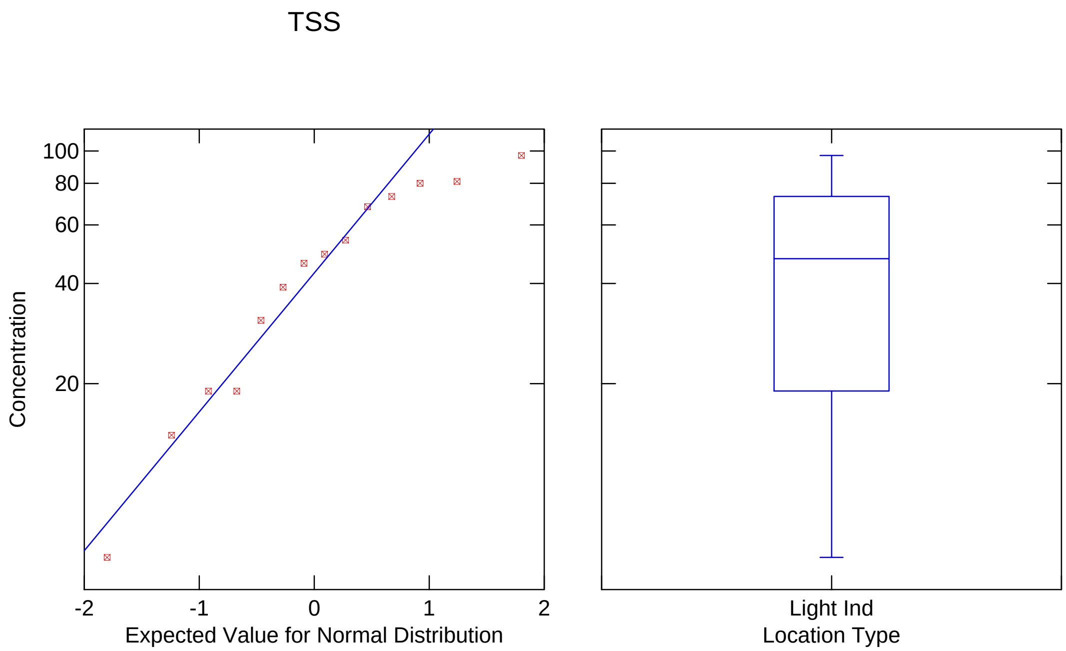

PCB-153, total
Concentration
12000
10000
8000
6000
4000
2000
0
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

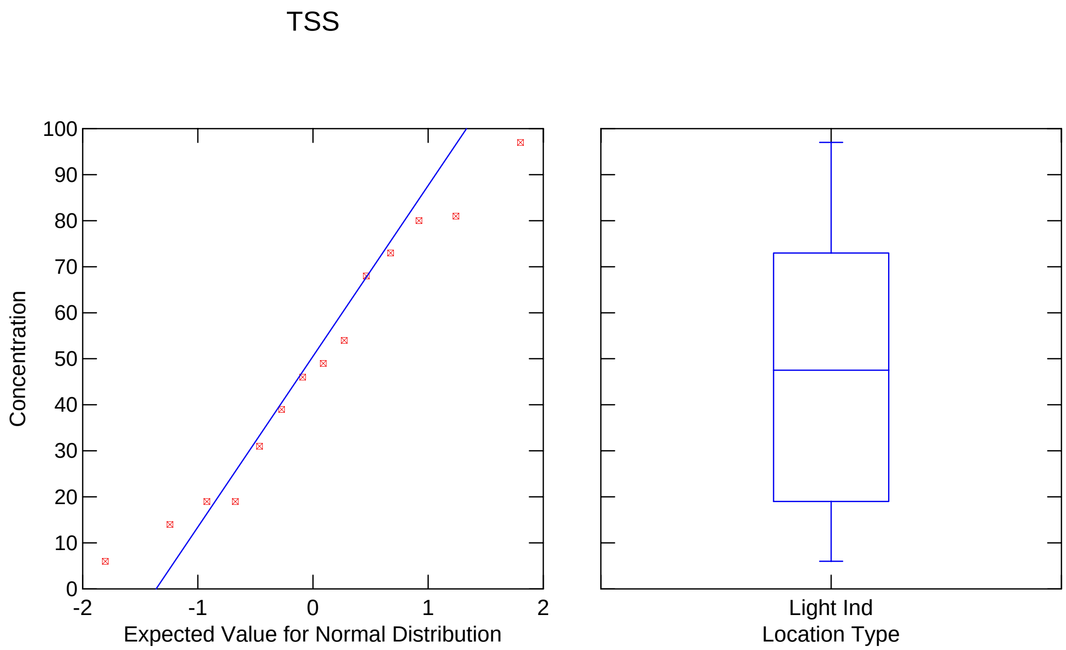
TOC


16
14
12
10
8
6
4
2
Concentration
-2
-1
0
1
2
Value
Light Ind
Location Type

TOC

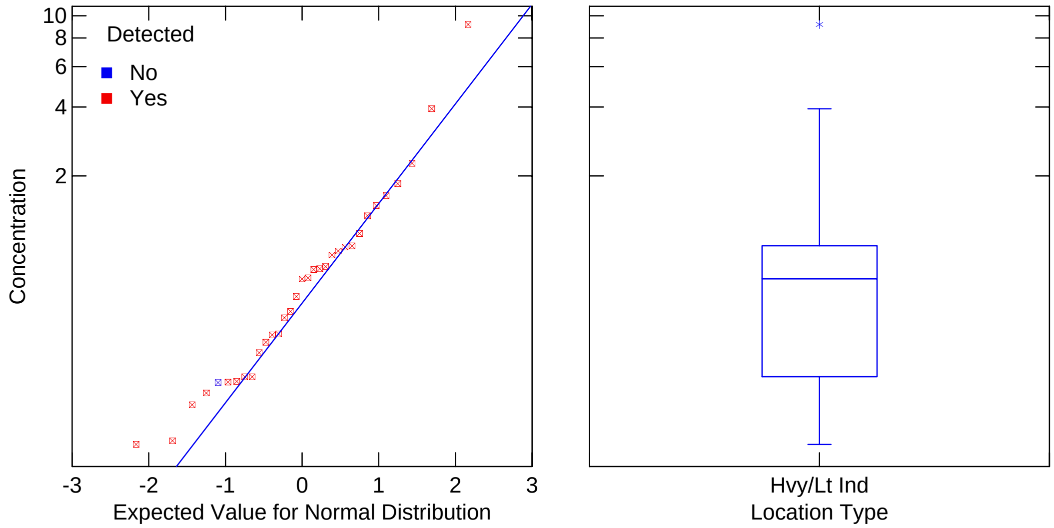

15
10
5
0
Concentration
-2
-1
0
1
2
Value
Light Ind
Location Type


TSS
100
80
60
40
20
Concentration
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

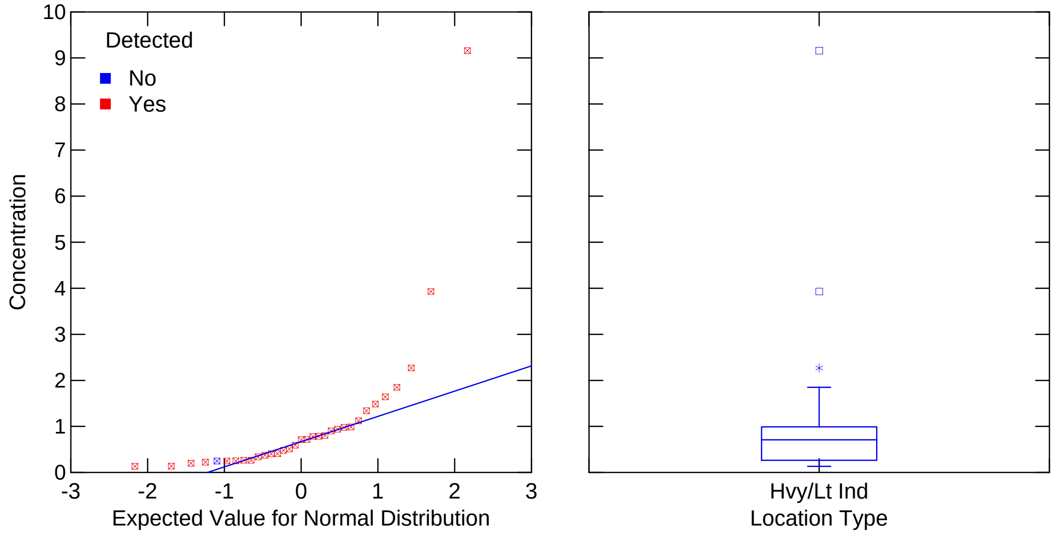

TSS
100
90
80
70
60
50
40
30
20
10
0
Concentration
-2
-1
0
1
2
Expected Value for Normal Distribution
Light Ind
Location Type

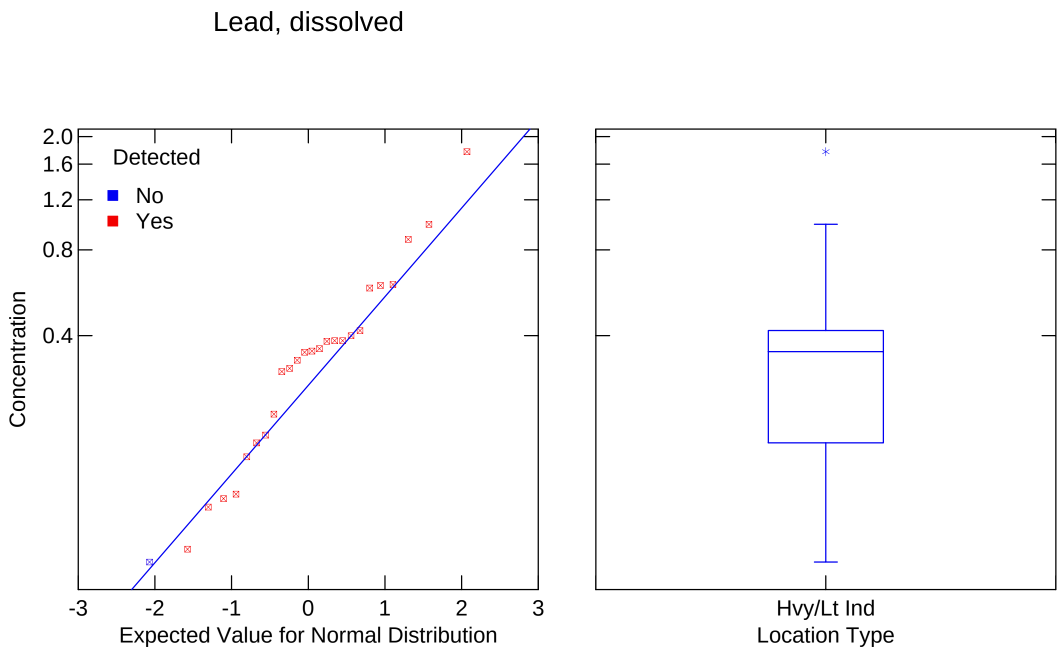
RECLASSIFIED DATA - REPRESENTATIVE COMBINED HEAVY/LIGHT INDUSTRIAL LO

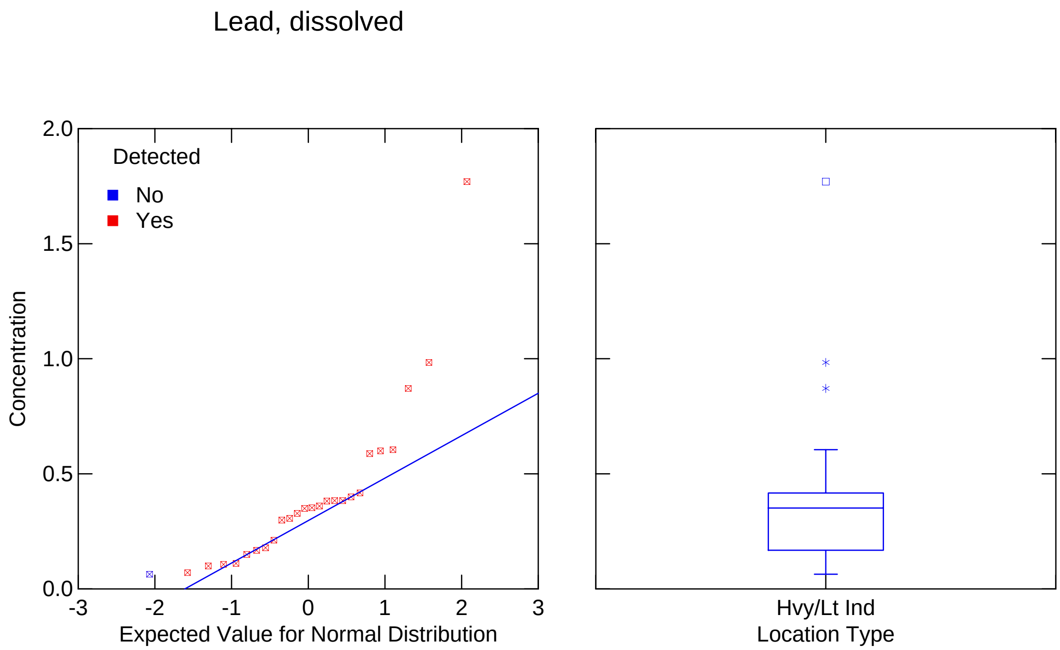
Arsenic, total

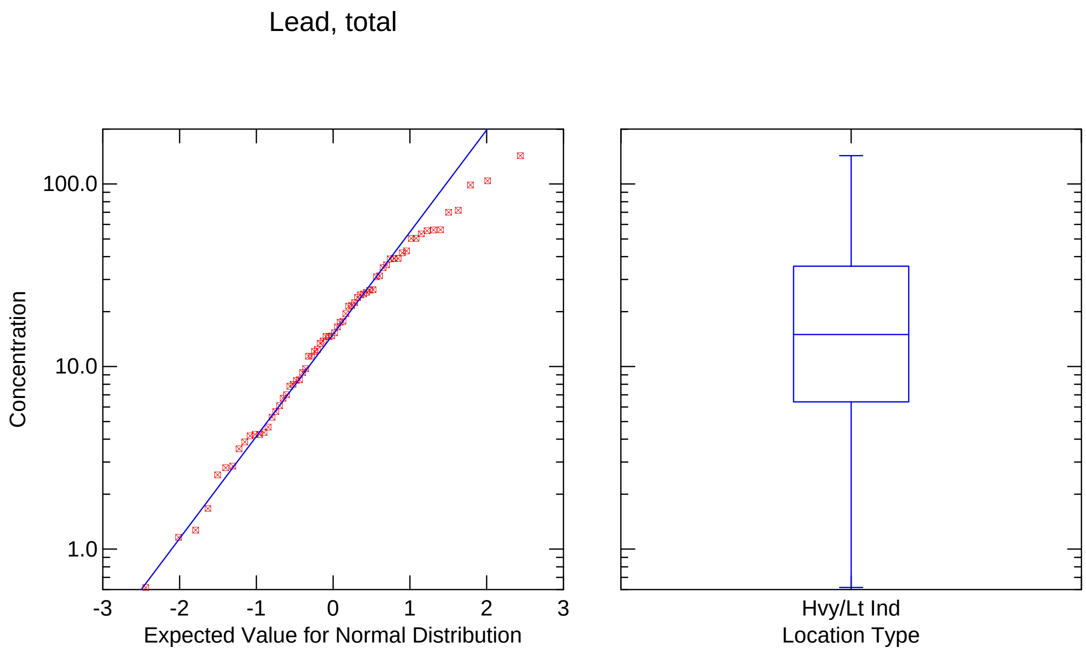


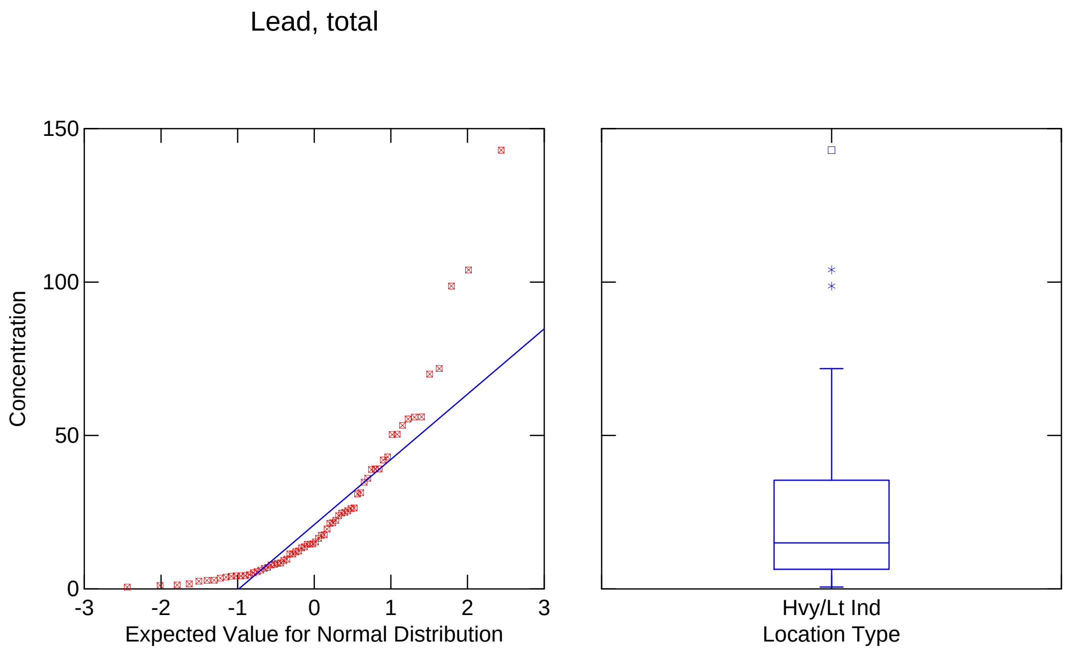
Arsenic, total

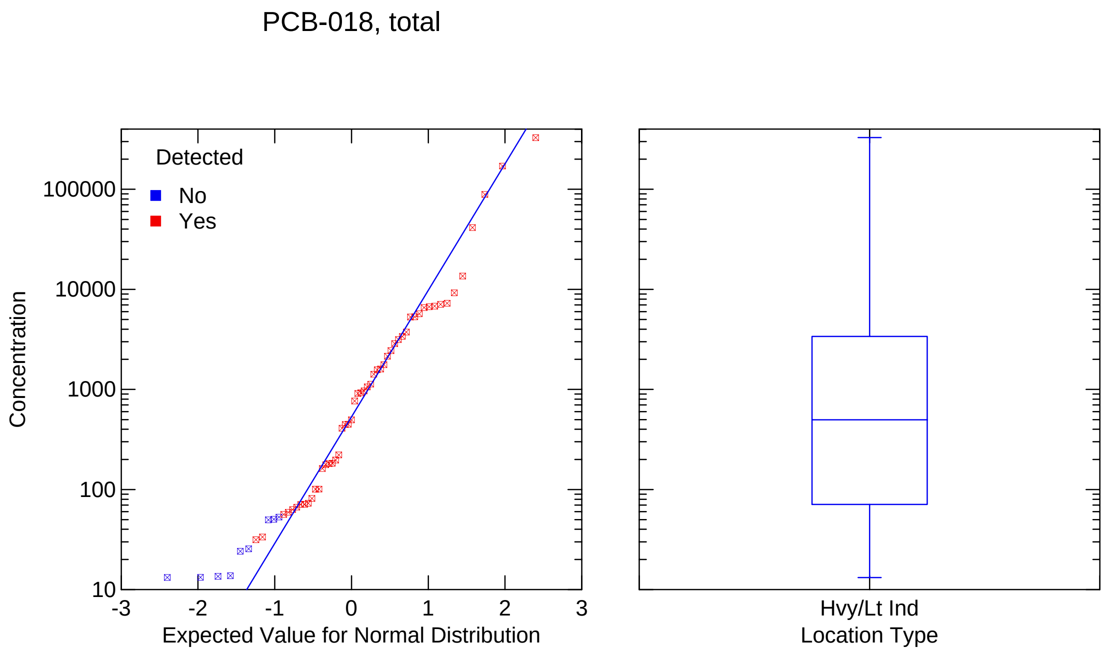


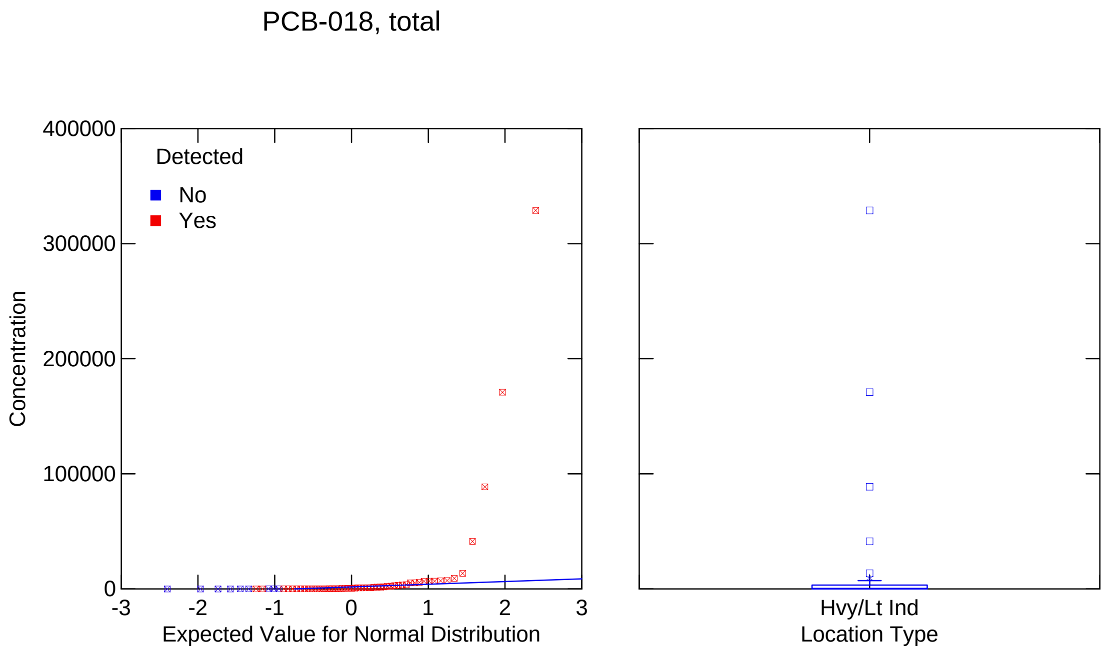

Lead, dissolved
Detected
No
Yes
2.0
1.6
1.2
0.8
0.4
Concentration
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Hvy/Lt Ind
Location Type


Lead, dissolved
Detected
No
Yes
2.0
1.5
1.0
0.5
0.0
Concentration
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Hvy/Lt Ind
Location Type

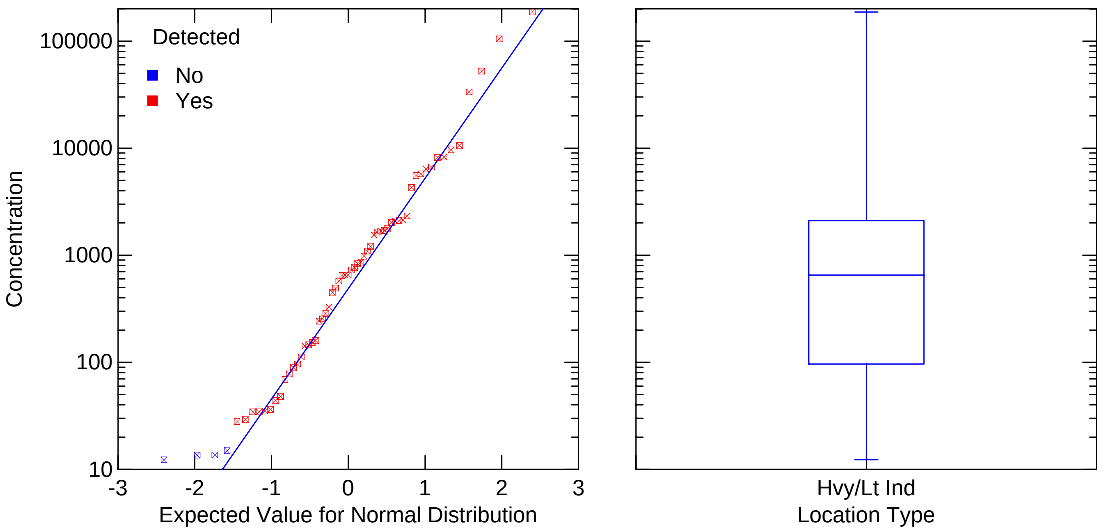

Lead, total
Concentration
100.0
10.0
1.0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Hvy/Lt Ind
Location Type


Lead, total
Concentration
150
100
50
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Hvy/Lt Ind
Location Type

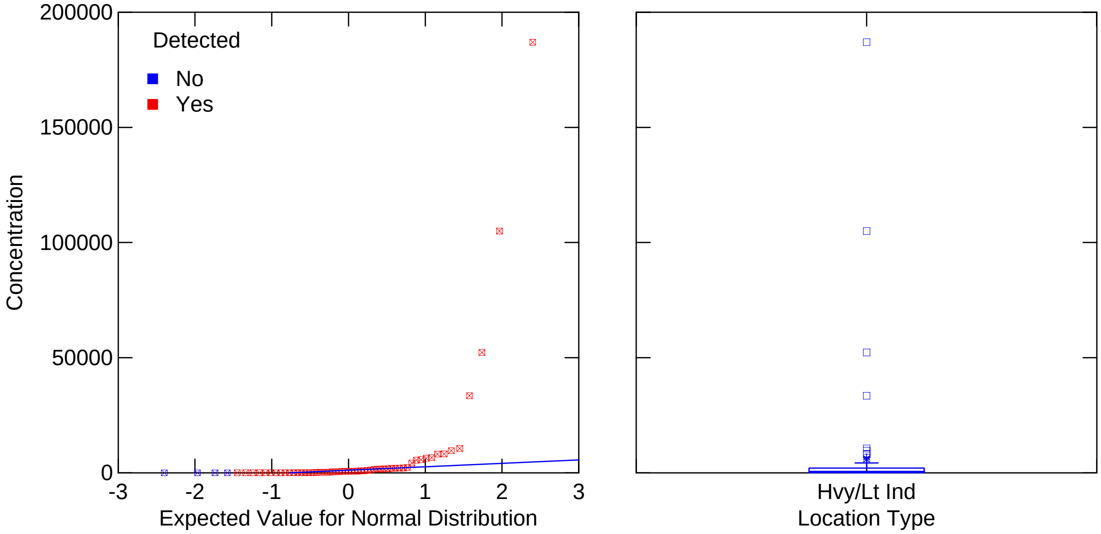

PCB-018, total
Detected
No
Yes
Concentration
100000
10000
1000
100
10
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Hvy/Lt Ind
Location Type


PCB-018, total
Detected
No
Yes
Concentration
400000
300000
200000
100000
0
-3
-2
-1
0
1
2
3
Expected Value for Normal Distribution
Hvy/Lt Ind
Location Type

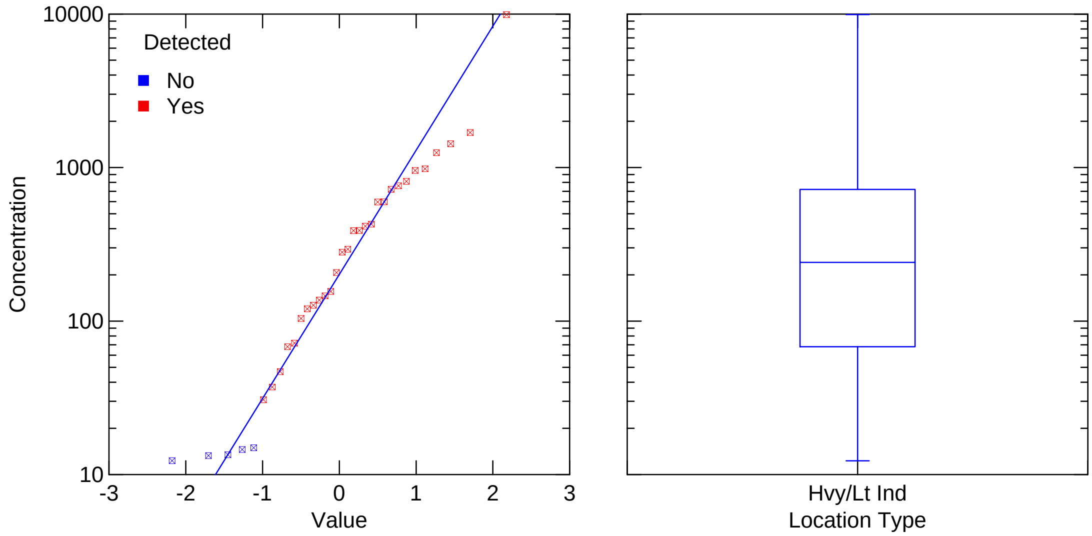
PCB-066, total



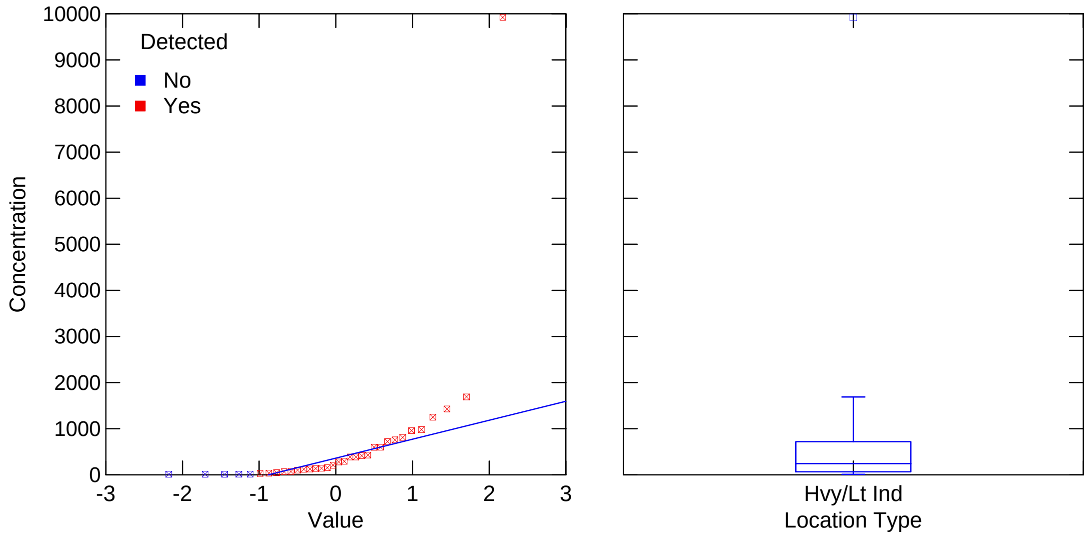
PCB-066, total



PCB-194, total



PCB-194, total



Appendix A-6
Classification Trees of Chemical Concentrations and Stormwater Variables

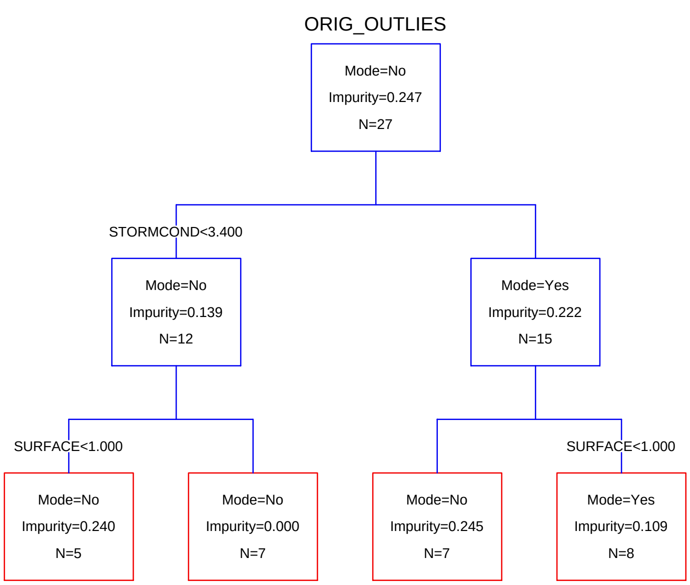
REPRESENTATIVE HEAVY INDUSTRIAL DATA

ARSENIC, TOTAL

Split	Variable	PRE	Improvement
1	STORMCOND	0.250	0.250
2	SURFACE	0.320	0.070
3	SURFACE	0.432	0.112

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.432

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	27	No	0.247	STORMCOND	3.400	0.250
2	1	12	No	0.139	SURFACE	1.000	0.280
3	1	15	Yes	0.222	SURFACE	1.000	0.223
4	2	5	No	0.240			
5	2	7	No	0.000			
6	3	8	Yes	0.109			
7	3	7	No	0.245			

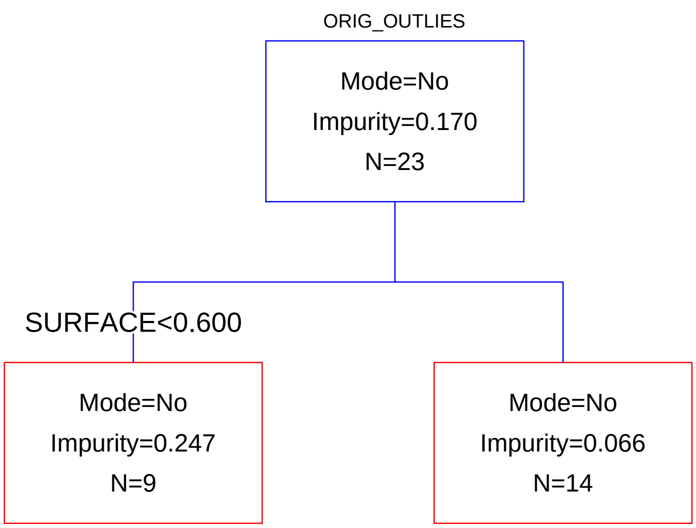


ARSENIC, DISSOLVED

Split	Variable	PRE	Improvement
1	SURFACE	0.195	0.195

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 2 terminal nodes
Proportional reduction in error: 0.195

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	23	No	0.170	SURFACE	0.600	0.195
2	1	9	No	0.247			
3	1	14	No	0.066			

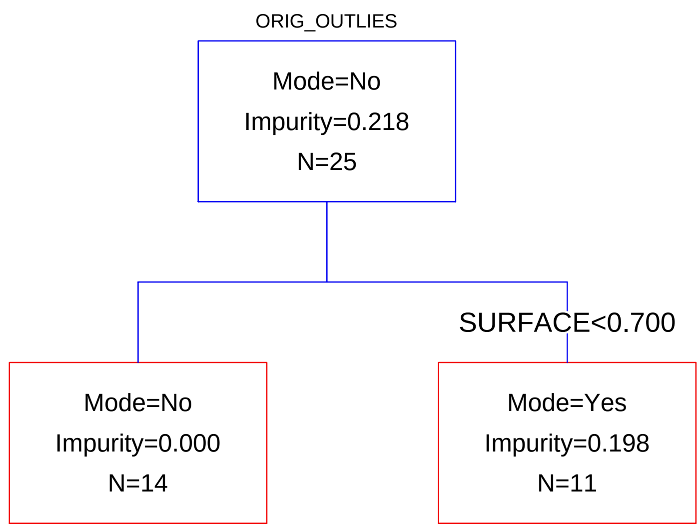


BENZO(A)PYRENE, TOTAL
2 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	SURFACE	0.599	0.599

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 2 terminal nodes
Proportional reduction in error: 0.599

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	25	No	0.218	SURFACE	0.700	0.599
2	1	11	Yes	0.198			
3	1	14	No	0.000			

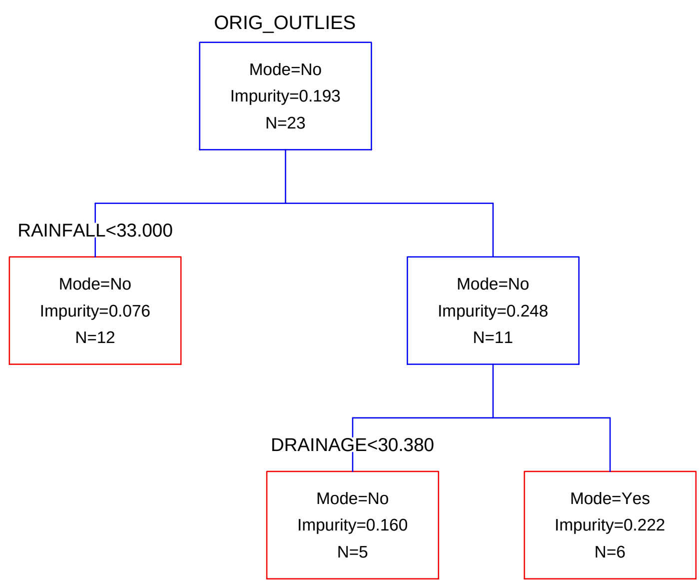


LEAD, DISSOLVED

Split	Variable	PRE	Improvement
1	RAINFALL	0.178	0.178
2	DRAINAGE	0.312	0.134

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 3 terminal nodes
Proportional reduction in error: 0.312

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	23	No	0.193	RAINFALL	33.000	0.178
2	1	12	No	0.076			
3	1	11	No	0.248	DRAINAGE	30.380	0.218
4	3	5	No	0.160			
5	3	6	Yes	0.222			

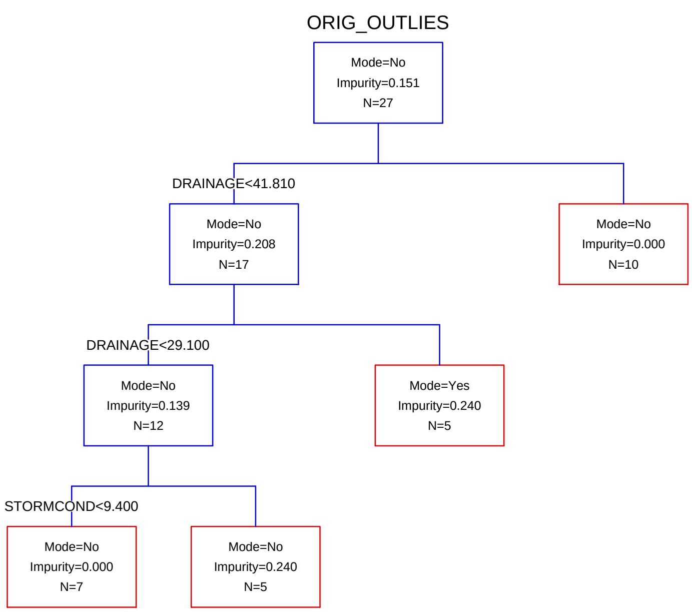


LEAD, TOTAL

Split	Variable	PRE	Improvement
1	DRAINAGE	0.134	0.134
2	DRAINAGE	0.296	0.163
3	STORMCOND	0.411	0.115

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.411

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	27	No	0.151	DRAINAGE	41.810	0.134
2	1	17	No	0.208	DRAINAGE	29.100	0.188
3	1	10	No	0.000			
4	2	12	No	0.139	STORMCOND	9.400	0.280
5	2	5	Yes	0.240			
6	4	7	No	0.000			
7	4	5	No	0.240			

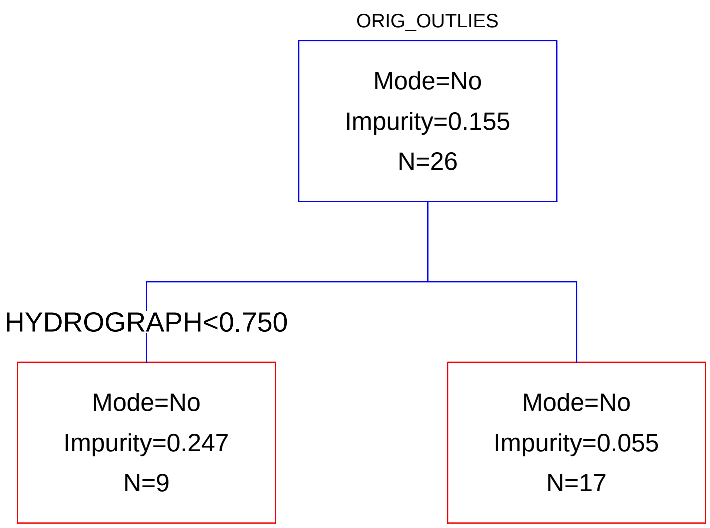


PCB-153, TOTAL
2 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	HYDROGRAPH	0.217	0.217

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 2 terminal nodes
Proportional reduction in error: 0.217

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	26	No	0.155	HYDROGRAPH	0.750	0.217
2	1	9	No	0.247			
3	1	17	No	0.055			



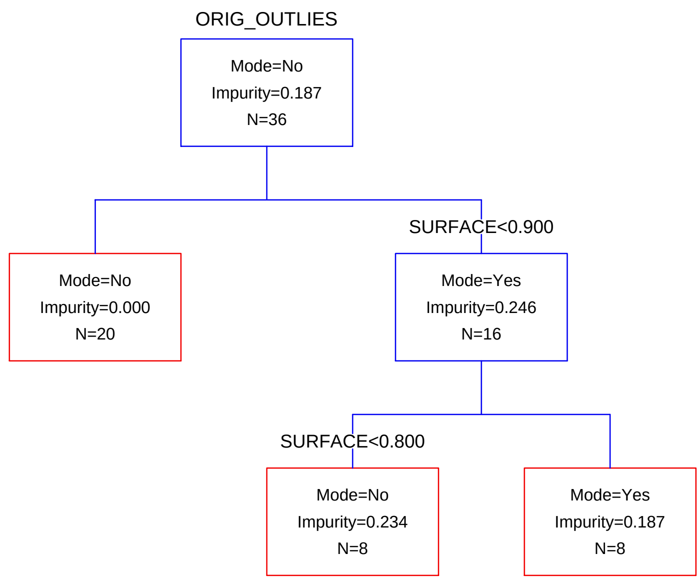
UNIQUE HEAVY INDUSTRIAL DATA

ARSENIC, TOTAL

Split	Variable	PRE	Improvement
1	SURFACE	0.417	0.417
2	SURFACE	0.500	0.083

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 3 terminal nodes
Proportional reduction in error: 0.500

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	36	No	0.187	SURFACE	0.900	0.417
2	1	16	Yes	0.246	SURFACE	0.800	0.143
3	1	20	No	0.000			
4	2	8	No	0.234			
5	2	8	Yes	0.187			

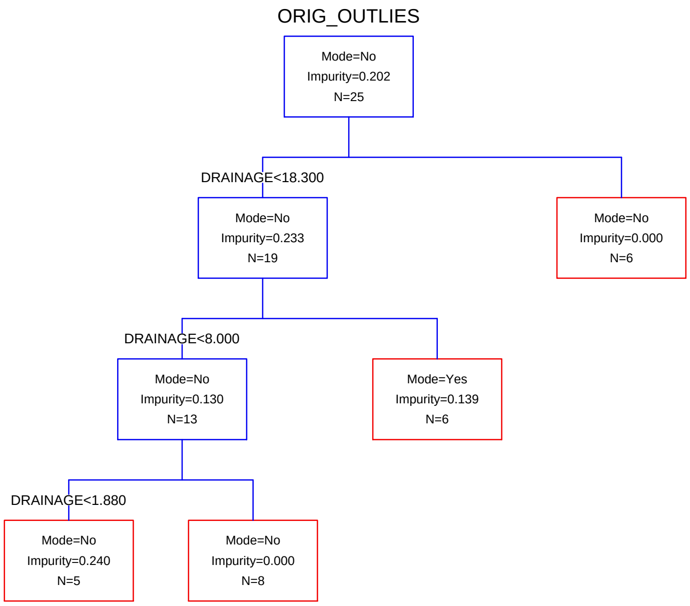


BENZO(A)PYRENE, TOTAL
7 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	DRAINAGE	0.123	0.123
2	DRAINAGE	0.499	0.376
3	DRAINAGE	0.597	0.098

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.597

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	25	No	0.202	DRAINAGE	18.300	0.123
2	1	19	No	0.233	DRAINAGE	8.000	0.429
3	1	6	No	0.000			
4	2	13	No	0.130	DRAINAGE	1.880	0.291
5	2	6	Yes	0.139			
6	4	5	No	0.240			
7	4	8	No	0.000			

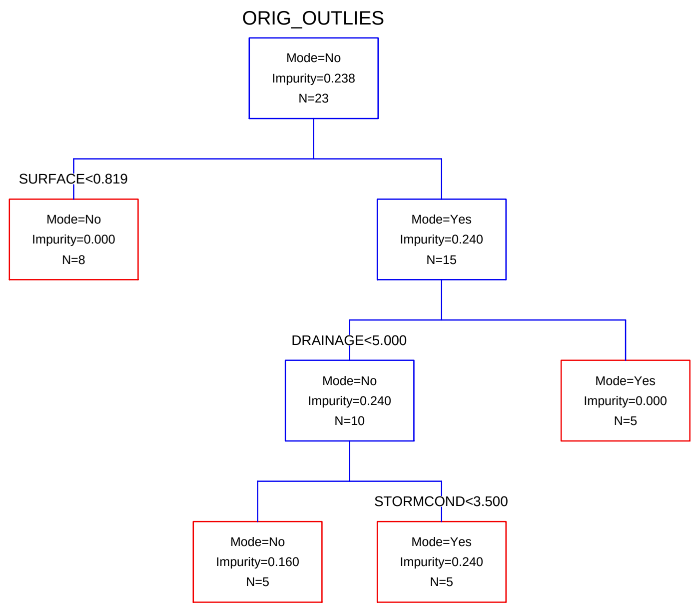


LEAD, DISSOLVED

Split	Variable	PRE	Improvement
1	SURFACE	0.343	0.343
2	DRAINAGE	0.562	0.219
3	STORMCOND	0.635	0.073

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.635

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	23	No	0.238	SURFACE	0.819	0.343
2	1	8	No	0.000			
3	1	15	Yes	0.240	DRAINAGE	5.000	0.333
4	3	10	No	0.240	STORMCOND	3.500	0.167
5	3	5	Yes	0.000			
6	4	5	Yes	0.240			
7	4	5	No	0.160			

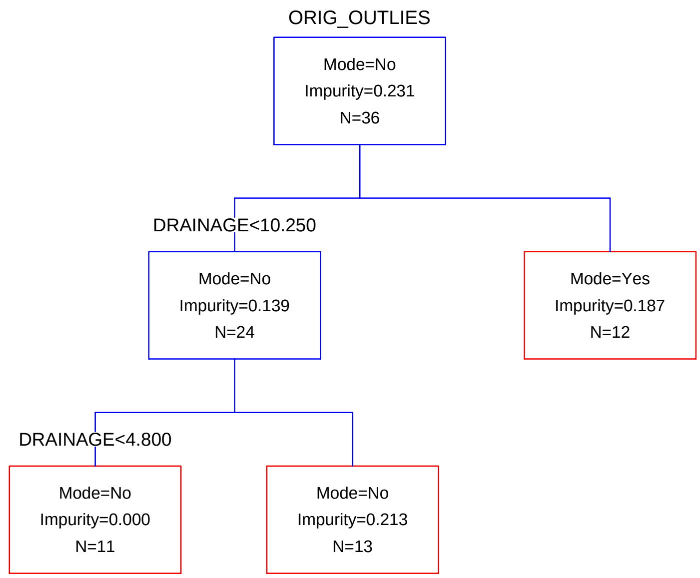


LEAD, TOTAL

Split	Variable	PRE	Improvement
1	DRAINAGE	0.328	0.328
2	DRAINAGE	0.396	0.068

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 3 terminal nodes
Proportional reduction in error: 0.396

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	36	No	0.231	DRAINAGE	10.250	0.328
2	1	24	No	0.139	DRAINAGE	4.800	0.169
3	1	12	Yes	0.187			
4	2	11	No	0.000			
5	2	13	No	0.213			

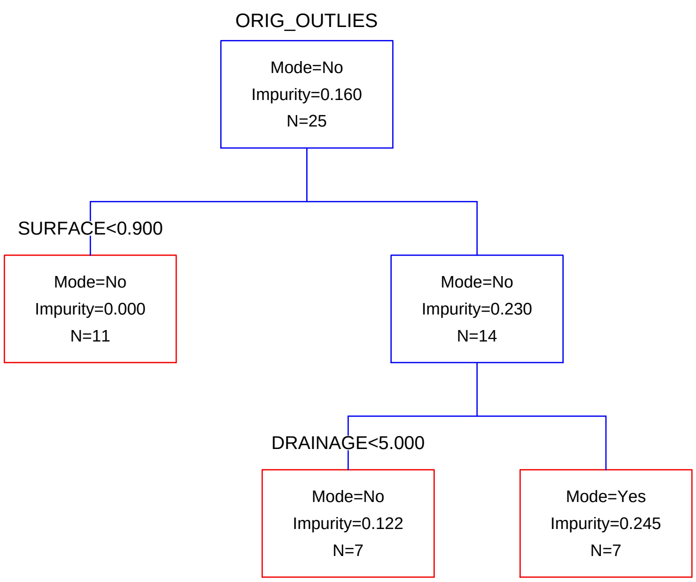


PCB-153, TOTAL
7 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	SURFACE	0.196	0.196
2	DRAINAGE	0.357	0.161

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 3 terminal nodes
Proportional reduction in error: 0.357

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	25	No	0.160	SURFACE	0.900	0.196
2	1	11	No	0.000			
3	1	14	No	0.230	DRAINAGE	5.000	0.200
4	3	7	No	0.122			
5	3	7	Yes	0.245			

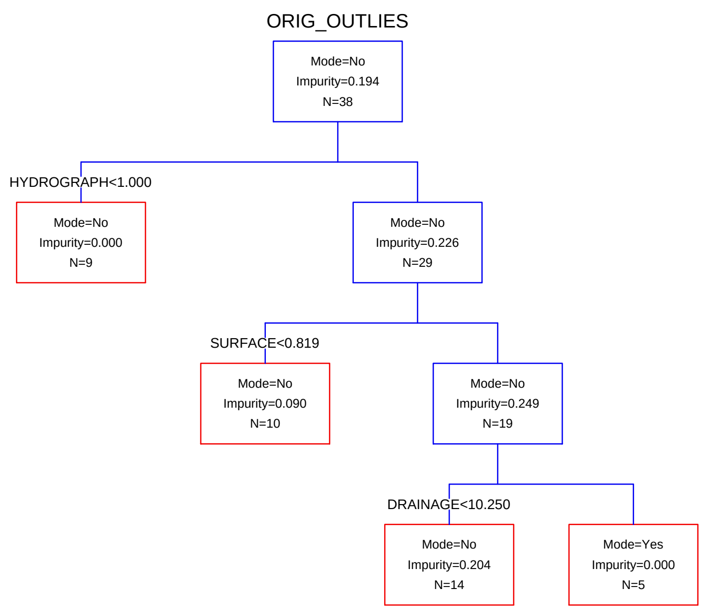


TOC
7 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	HYDROGRAPH	0.111	0.111
2	SURFACE	0.235	0.124
3	DRAINAGE	0.490	0.255

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.490

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	38	No	0.194	HYDROGRAPH	1.000	0.111
2	1	9	No	0.000			
3	1	29	No	0.226	SURFACE	0.819	0.140
4	3	10	No	0.090			
5	3	19	No	0.249	DRAINAGE	10.250	0.397
6	5	14	No	0.204			
7	5	5	Yes	0.000			

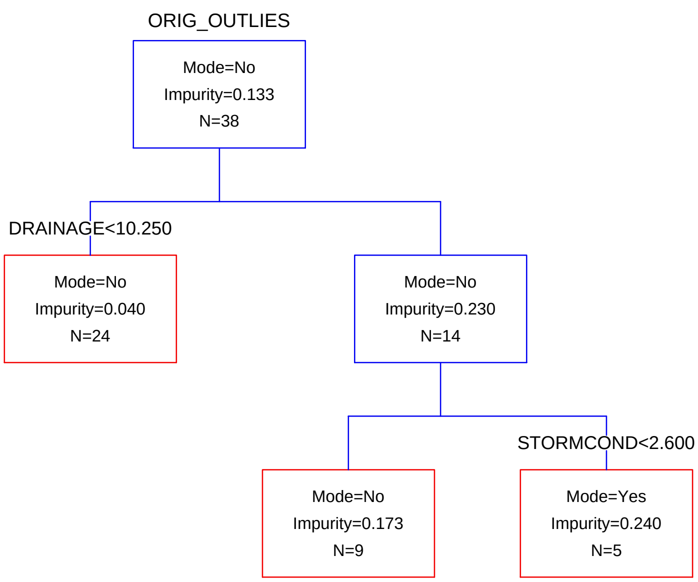


TSS
7 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	DRAINAGE	0.174	0.174
2	STORMCOND	0.265	0.091

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 3 terminal nodes
Proportional reduction in error: 0.265

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	38	No	0.133	DRAINAGE	10.250	0.174
2	1	24	No	0.040			
3	1	14	No	0.230	STORMCOND	2.600	0.143
4	3	5	Yes	0.240			
5	3	9	No	0.173			



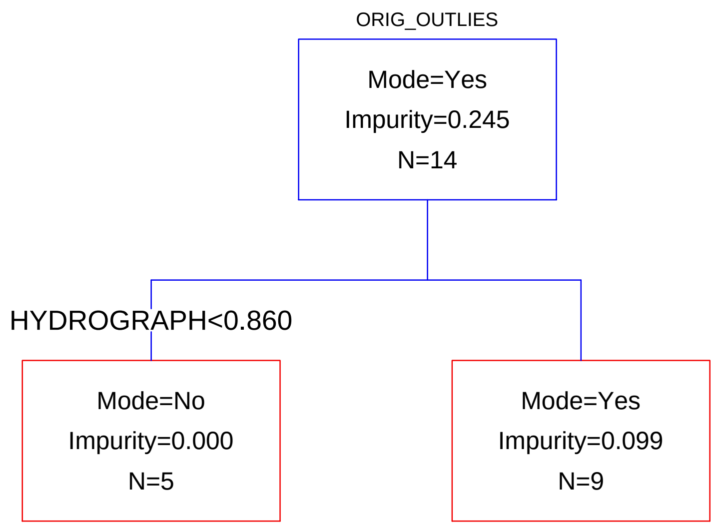
REPRESENTATIVE LIGHT INDUSTRIAL DATA

LEAD, TOTAL

Split	Variable	PRE	Improvement
1	HYDROGRAPH	0.741	0.741

Fitting Method: Phi-Square
Predicted variable: ORIG_OUTLIE$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 2 terminal nodes
Proportional reduction in error: 0.741

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	14	Yes	0.245	HYDROGRAPH	0.860	0.741
2	1	5	No	0.000			
3	1	9	Yes	0.099			



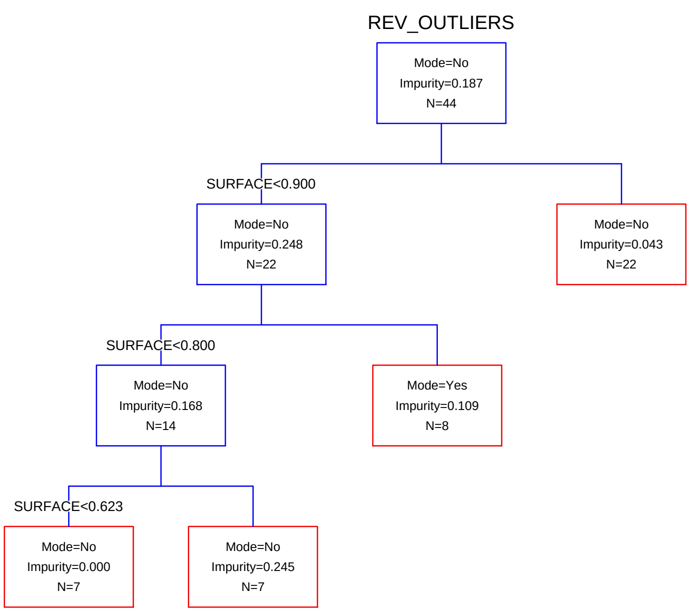
RECLASSIFIED DATA
UNIQUE HEAVY INDUSTRIAL DATA

ARSENIC, TOTAL

Split	Variable	PRE	Improvement
1	SURFACE	0.223	0.223
2	SURFACE	0.493	0.269
3	SURFACE	0.570	0.078

Fitting Method: Phi-Square
Predicted variable: REV_OUTLIER$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.570

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	44	No	0.187	SURFACE	0.900	0.223
2	1	22	No	0.248	SURFACE	0.800	0.407
3	1	22	No	0.043			
4	2	14	No	0.168	SURFACE	0.623	0.273
5	2	8	Yes	0.109			
6	4	7	No	0.000			
7	4	7	No	0.245			



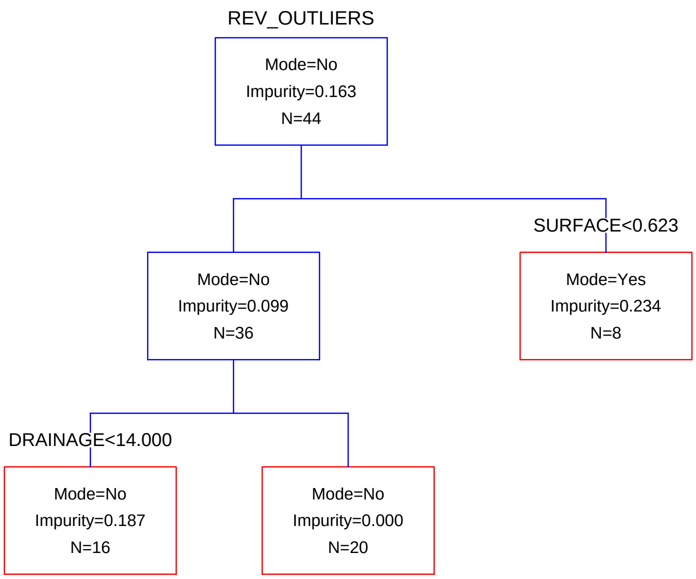
REPRESENTATIVE HEAVY INDUSTRIAL DATA

BENZO(A)PYRENE, TOTAL
9 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	SURFACE	0.241	0.241
2	DRAINAGE	0.319	0.078

Fitting Method: Phi-Square
Predicted variable: REV_OUTLIER$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 3 terminal nodes
Proportional reduction in error: 0.319

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	44	No	0.163	SURFACE	0.623	0.241
2	1	8	Yes	0.234			
3	1	36	No	0.099	DRAINAGE	14.000	0.156
4	3	16	No	0.187			
5	3	20	No	0.000			

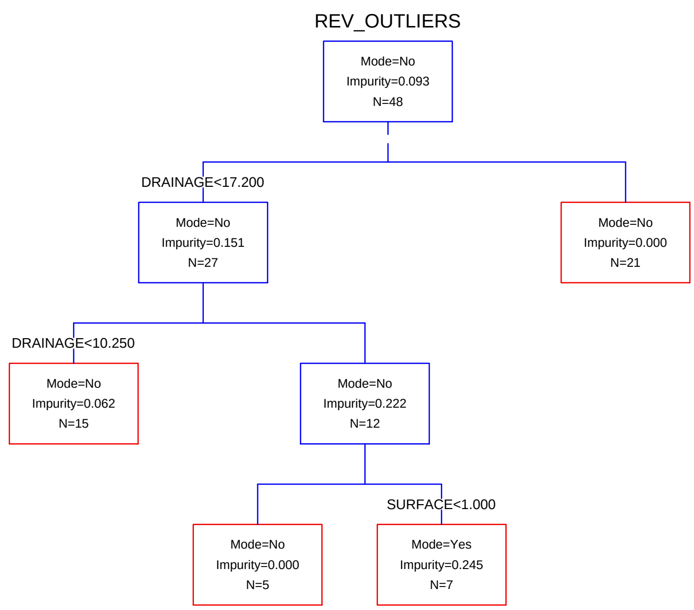


PCB-106, TOTAL
9 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	DRAINAGE	0.090	0.090
2	DRAINAGE	0.196	0.106
3	SURFACE	0.409	0.213

Fitting Method: Phi-Square
Predicted variable: REV_OUTLIER$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.409

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	48	No	0.093	DRAINAGE	17.200	0.090
2	1	27	No	0.151	DRAINAGE	10.250	0.116
3	1	21	No	0.000			
4	2	15	No	0.062			
5	2	12	No	0.222	SURFACE	1.000	0.357
6	5	7	Yes	0.245			
7	5	5	No	0.000			

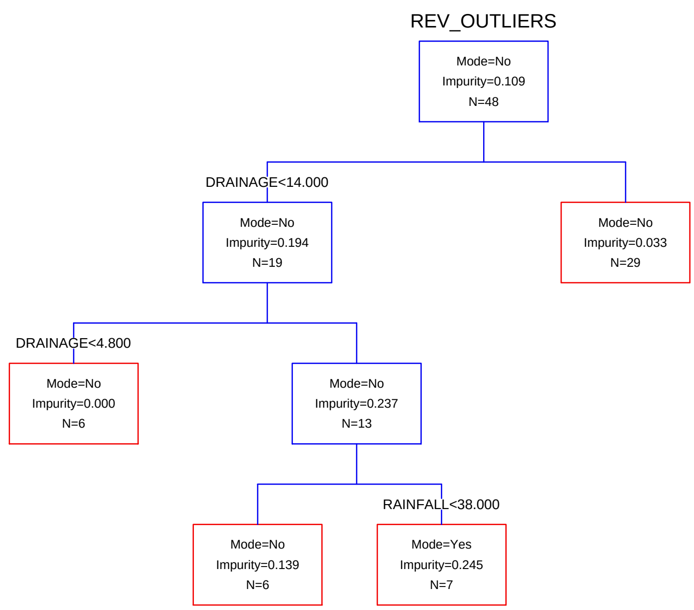


PCB-153, TOTAL
9 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	DRAINAGE	0.114	0.114
2	DRAINAGE	0.230	0.116
3	RAINFALL	0.331	0.101

Fitting Method: Phi-Square
Predicted variable: REV_OUTLIER$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.331

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	48	No	0.109	DRAINAGE	14.000	0.114
2	1	19	No	0.194	DRAINAGE	4.800	0.165
3	1	29	No	0.033			
4	2	6	No	0.000			
5	2	13	No	0.237	RAINFALL	38.000	0.172
6	5	7	Yes	0.245			
7	5	6	No	0.139			

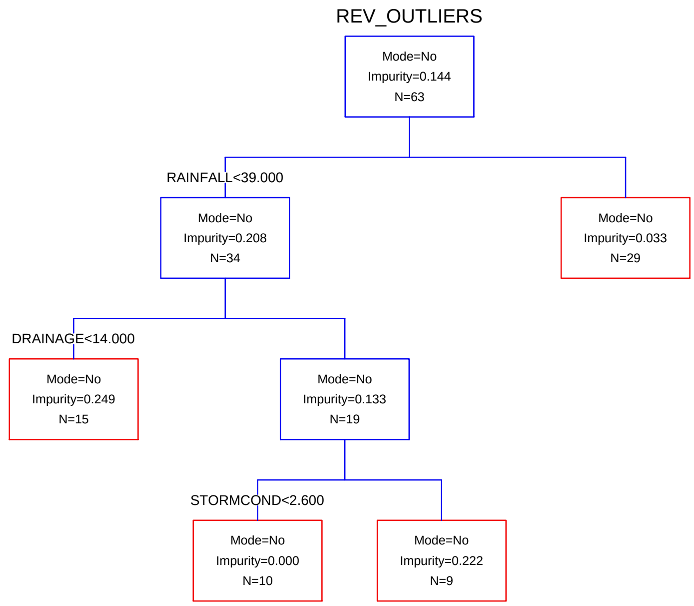


TOC
9 cases deleted due to missing data.

Split	Variable	PRE	Improvement
1	RAINFALL	0.116	0.116
2	DRAINAGE	0.204	0.088
3	STORMCOND	0.262	0.058

Fitting Method: Phi-Square
Predicted variable: REV_OUTLIER$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 4 terminal nodes
Proportional reduction in error: 0.262

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	63	No	0.144	RAINFALL	39.000	0.116
2	1	34	No	0.208	DRAINAGE	14.000	0.113
3	1	29	No	0.033			
4	2	15	No	0.249			
5	2	19	No	0.133	STORMCOND	2.600	0.208
6	5	10	No	0.000			
7	5	9	No	0.222			



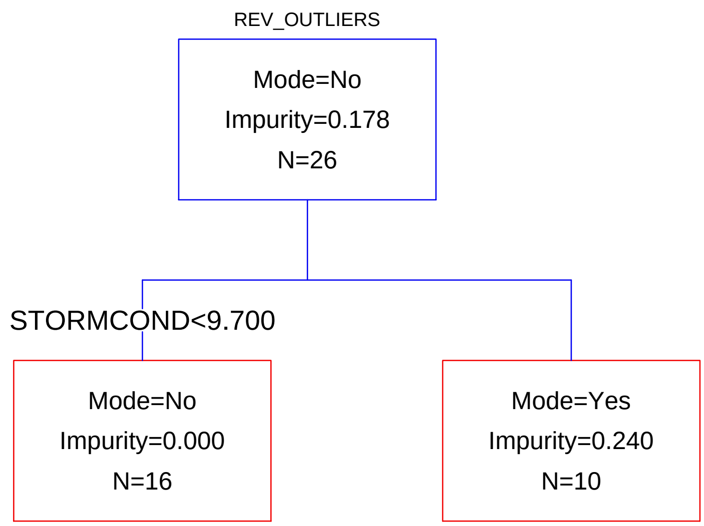
REPRESENTATIVE COMBINED HEAVY/LIGHT INDUSTRIAL DATA

LEAD, DISSOLVED

Split	Variable	PRE	Improvement
1	STORMCOND	0.480	0.480

Fitting Method: Phi-Square
Predicted variable: REV_OUTLIER$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 2 terminal nodes
Proportional reduction in error: 0.480

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	26	No	0.178	STORMCOND	9.700	0.480
2	1	16	No	0.000			
3	1	10	Yes	0.240			



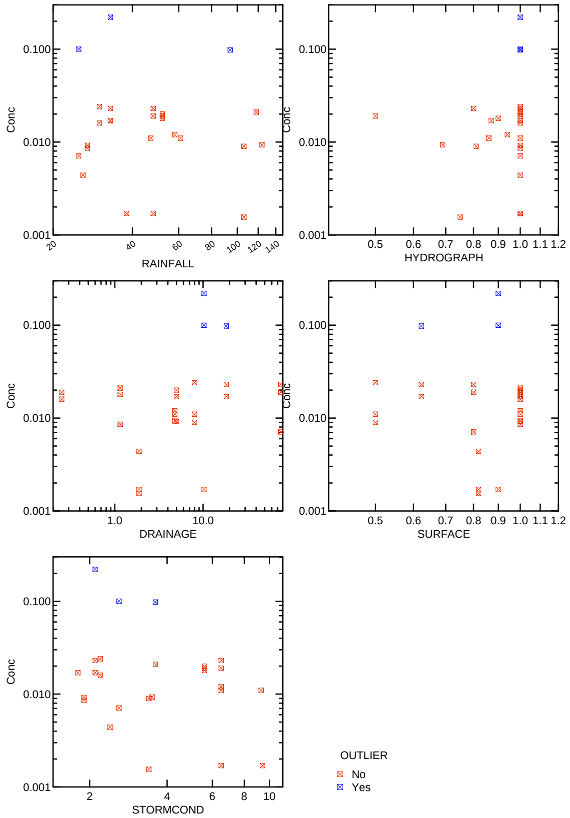
LEAD, TOTAL
Split Variable PRE Improvement
Fitting Method: Phi-Square
Predicted variable: REV_OUTLIER$
Minimum split index value: 0.050
Minimum improvement in PRE: 0.050
Maximum number of nodes allowed: 22
Minimum count allowed in each node: 5
The final tree contains 1 terminal nodes
Proportional reduction in error: 0.000

Node	from	Count	Mode	Impurity	Split Var	Cut Value	Fit
1	0	68	No	0.068			

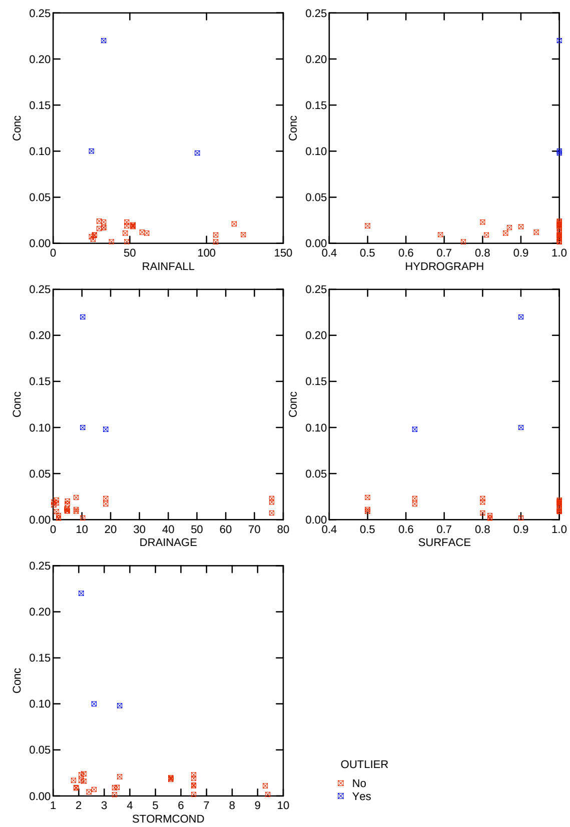
Appendix A-7
Scatterplots of Chemical Concentrations and Stormwater Variables

ORIGINAL UNIQUE HEAVY INDUSTRIAL Q-Q AND BOX PLOTS
ACENAPHTHYLENE, TOTAL

LOG-LOG SCALE

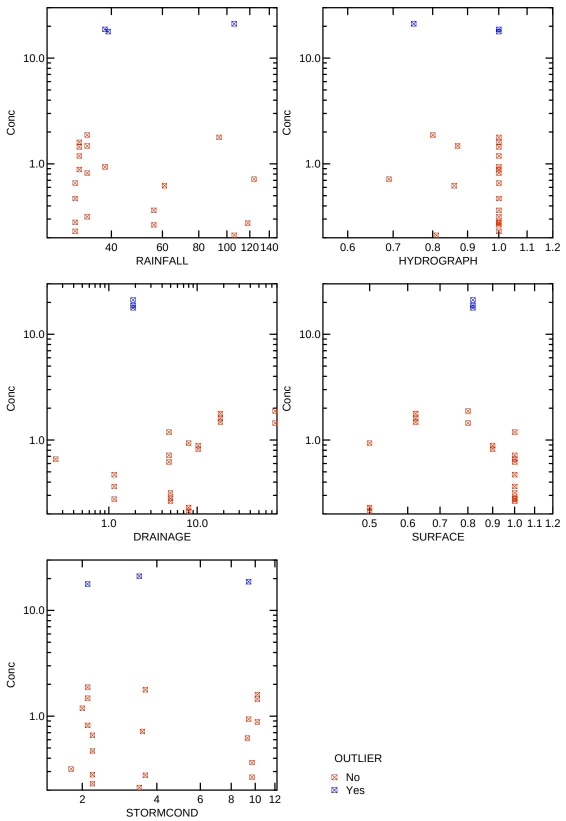


NORMAL SCALE

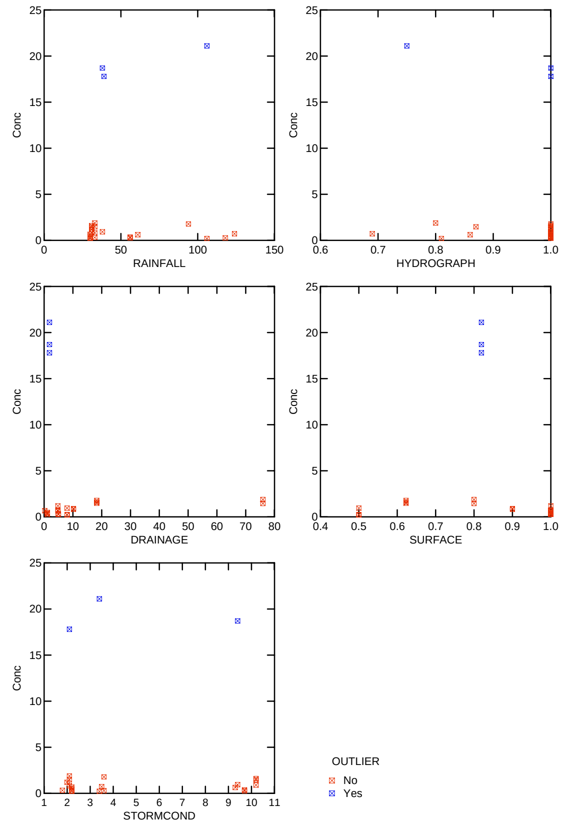


ARSENIC, DISSOLVED

LOG-LOG SCALE

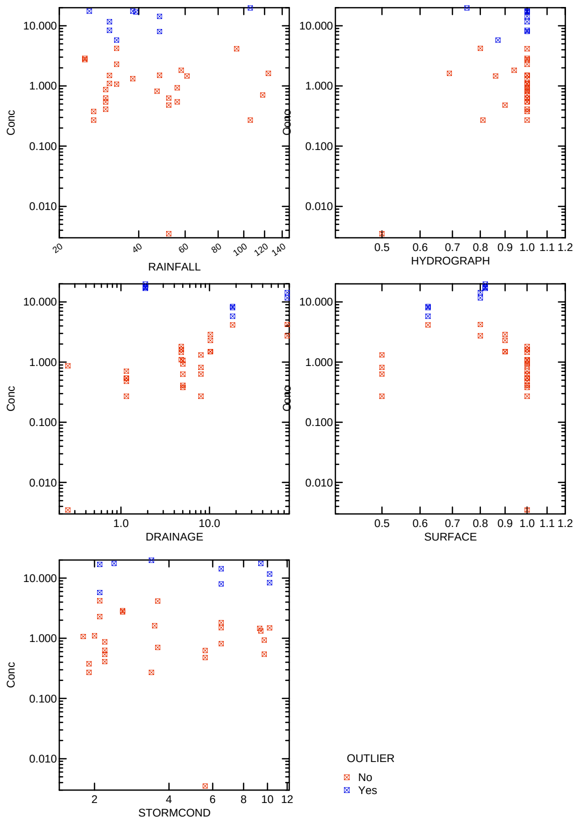


NORMAL SCALE

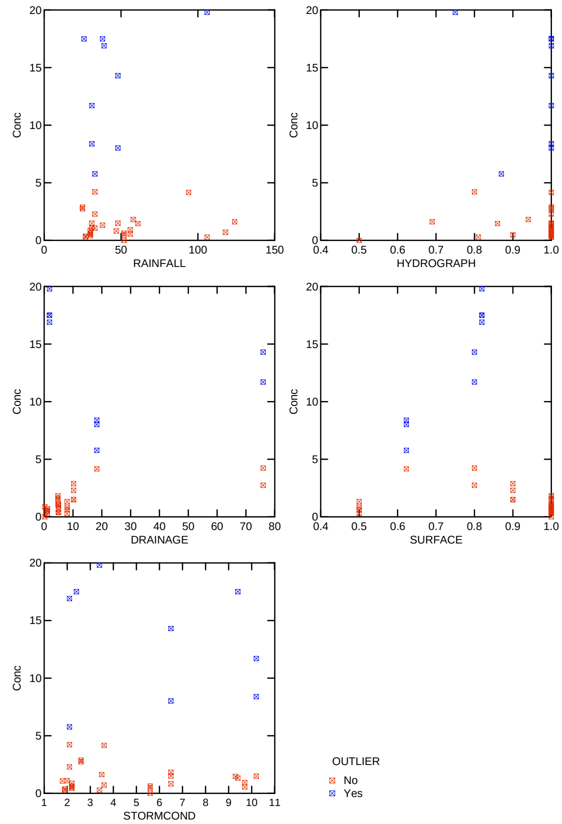


ARSENIC, TOTAL

LOG-LOG SCALE

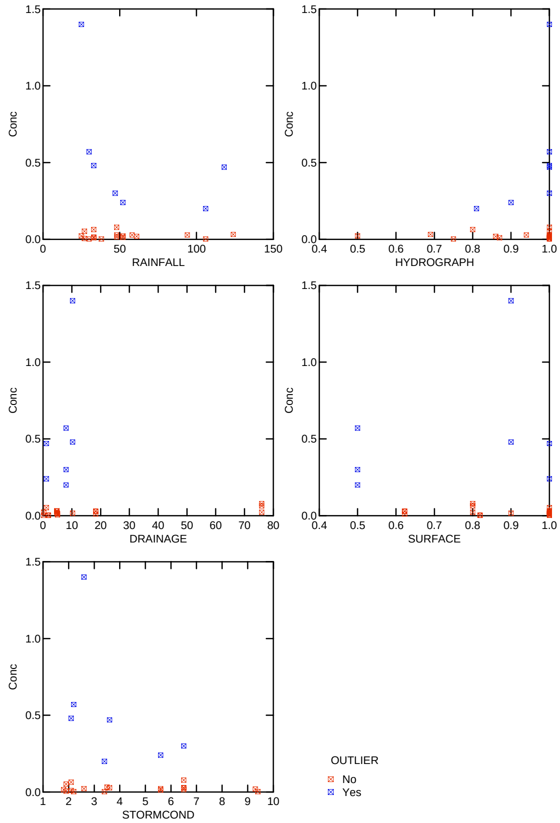


NORMAL SCALE

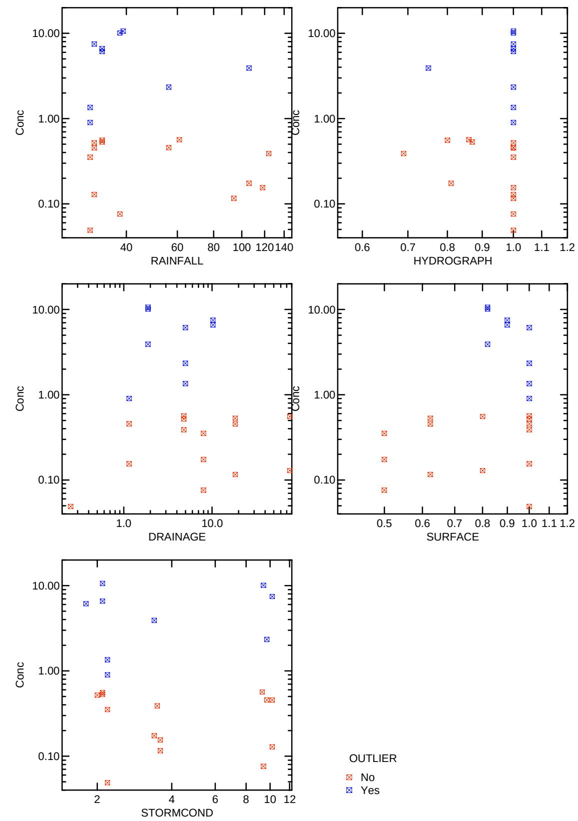


LEAD, DISSOLVED

NORMAL SCALE

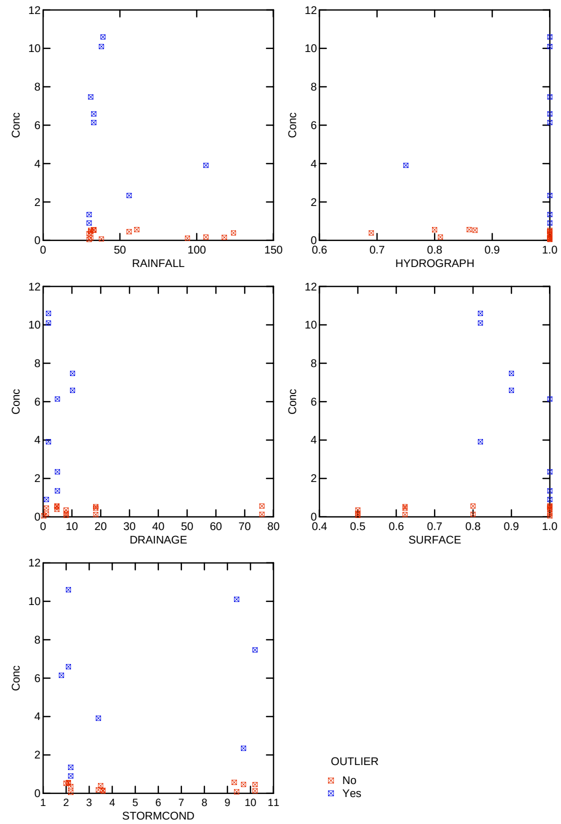


LOG-LOG SCALE

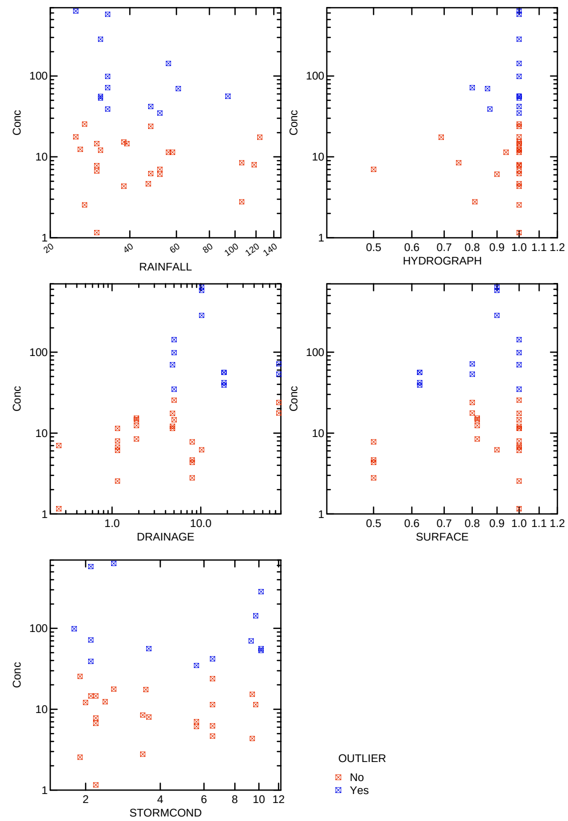


LEAD, TOTAL

NORMAL SCALE

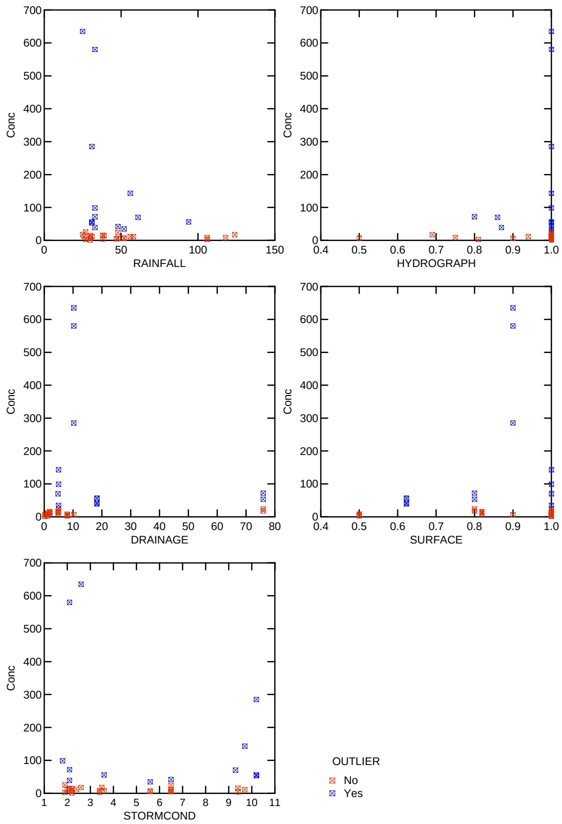


LOG-LOG SCALE

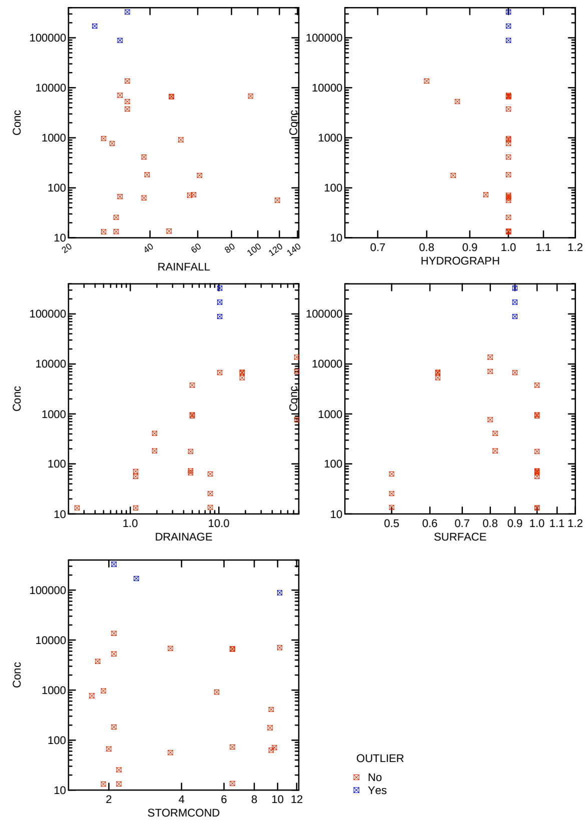


PCB-018, TOTAL

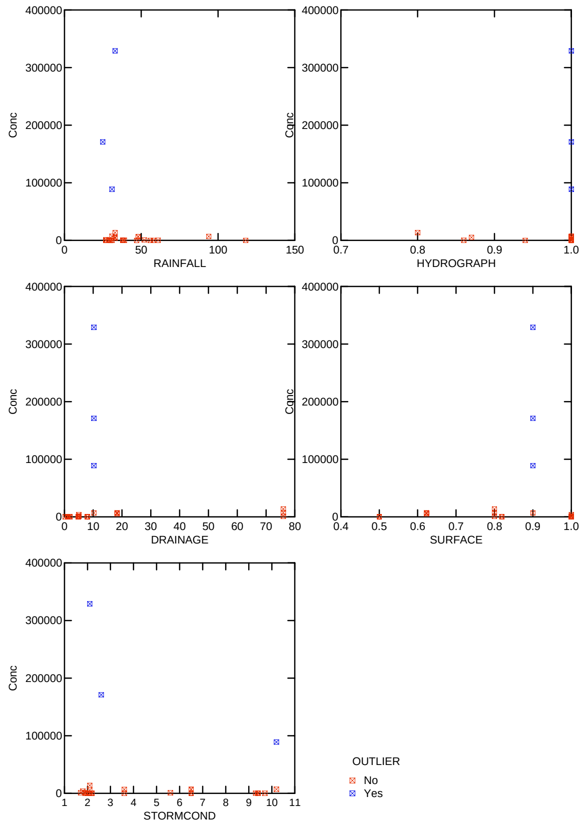
NORMAL SCALE



LOG-LOG SCALE

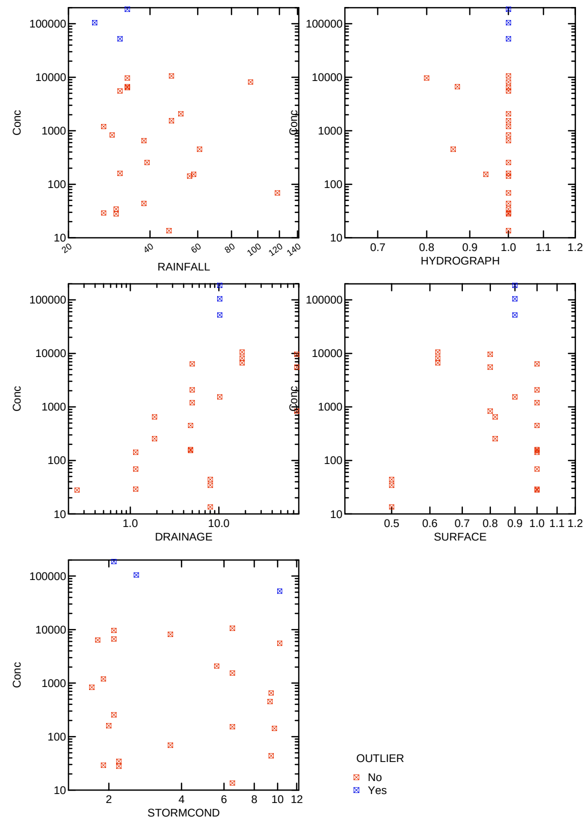


NORMAL SCALE

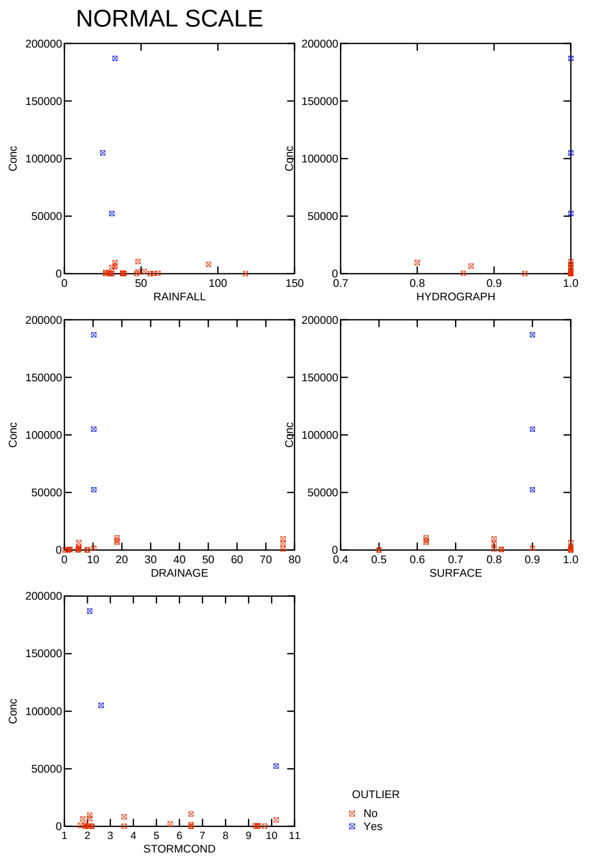


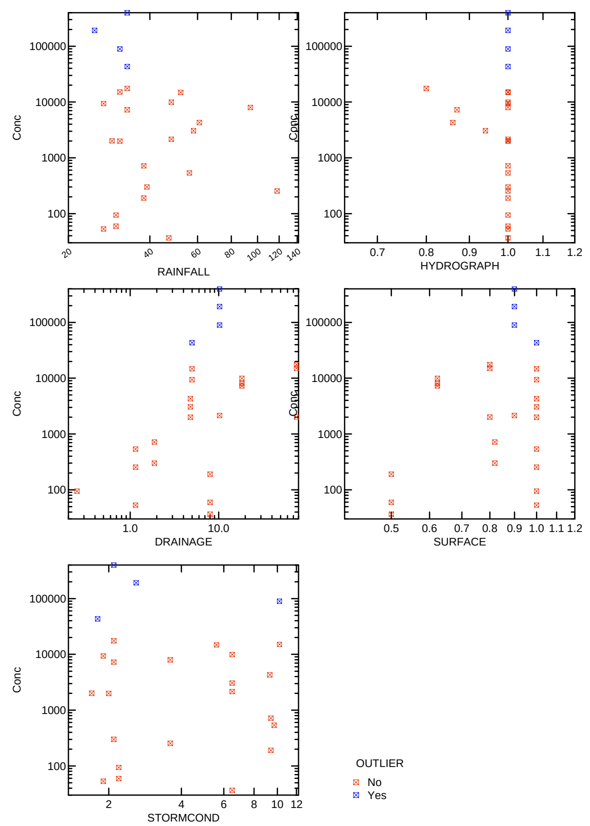
PCB-066, TOTAL

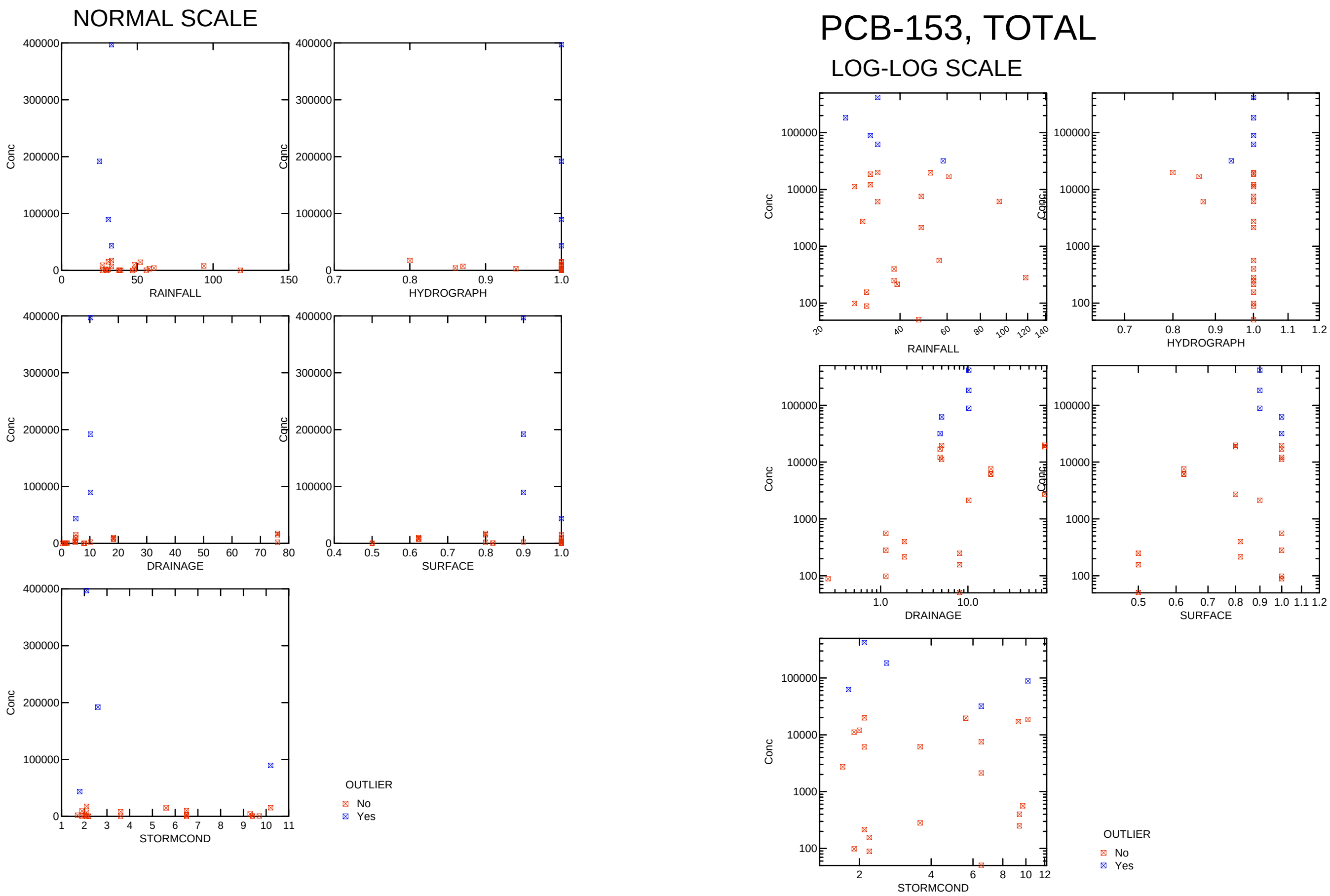
LOG-LOG SCALE



PCB-106, TOTAL

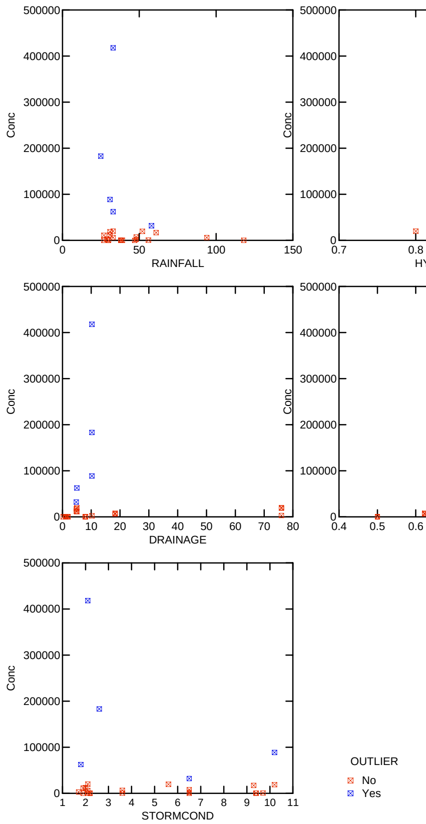




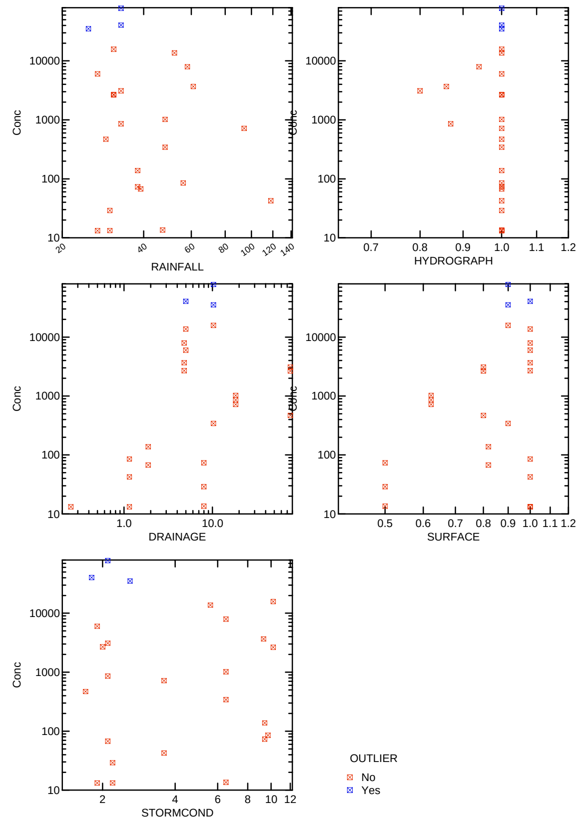

PCB-153, TOTAL
NORMAL SCALE
LOG-LOG SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND
OUTLIER
No
Yes

PCB-194, TOTAL

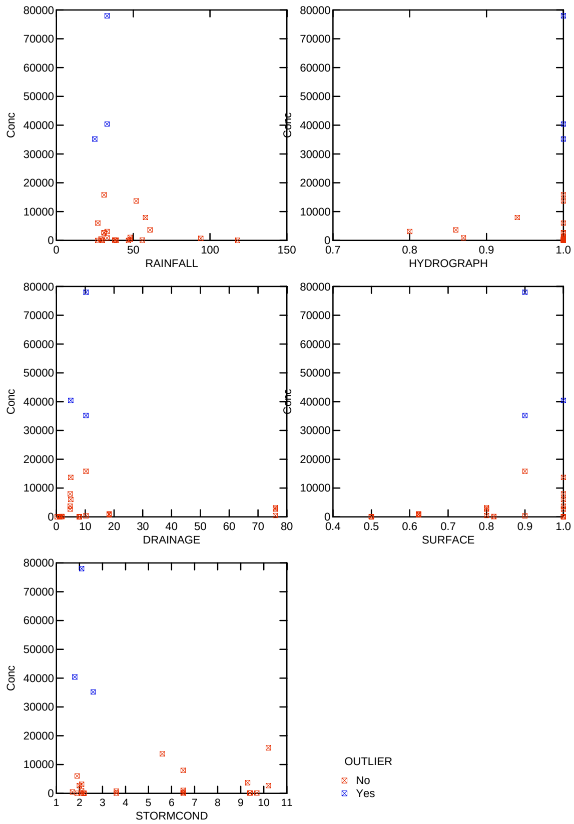
NORMAL SCALE



LOG-LOG SCALE

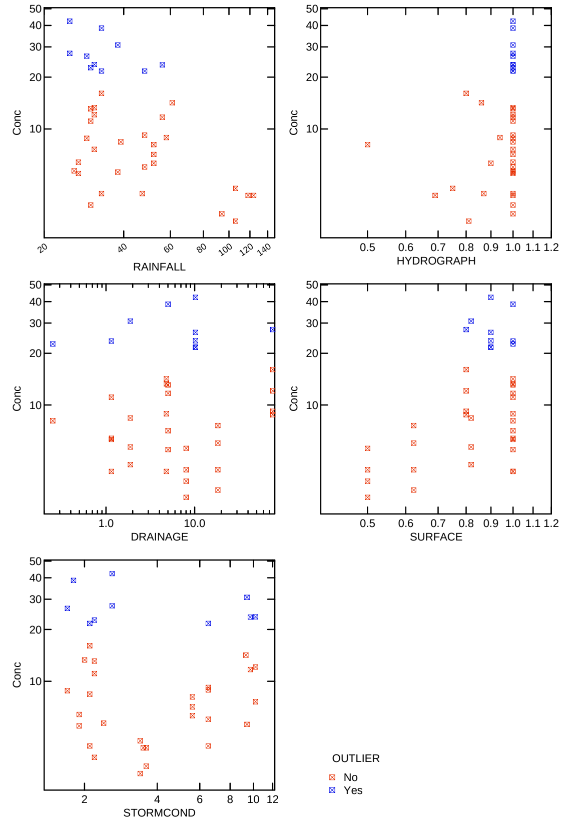


NORMAL SCALE



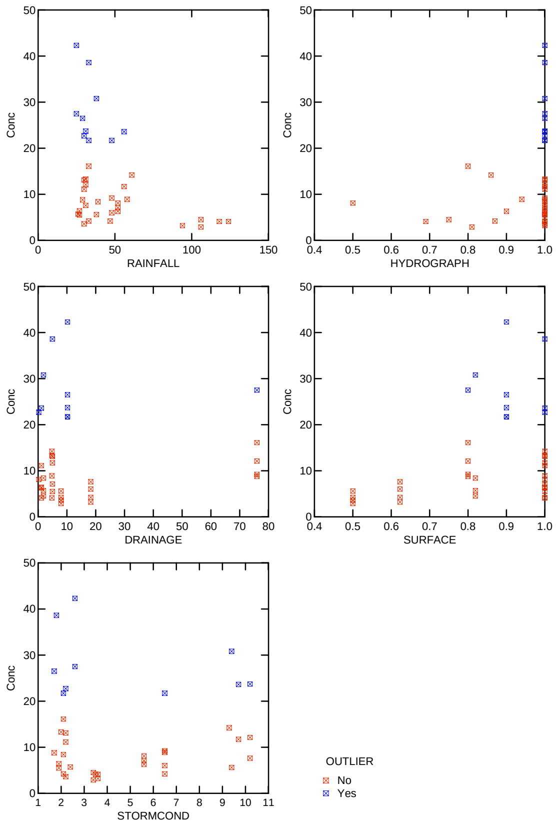
TOC

LOG-LOG SCALE

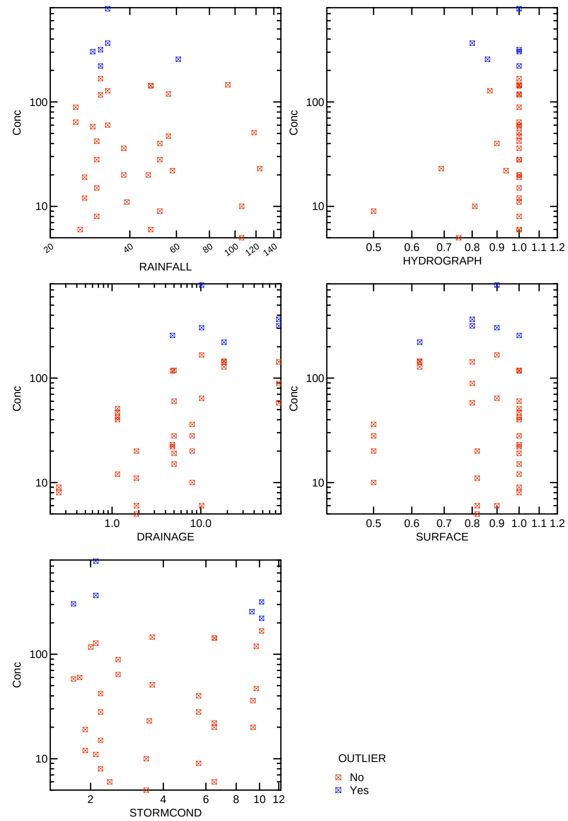


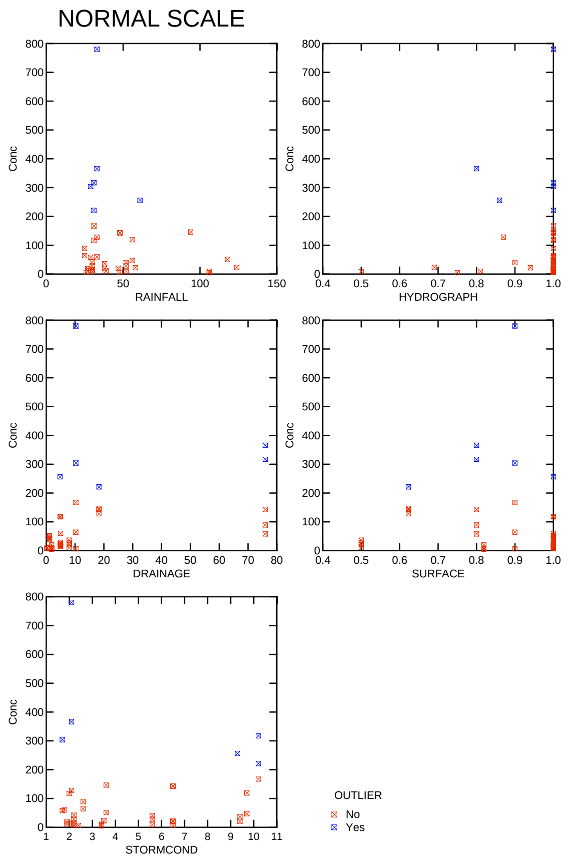
TSS

NORMAL SCALE



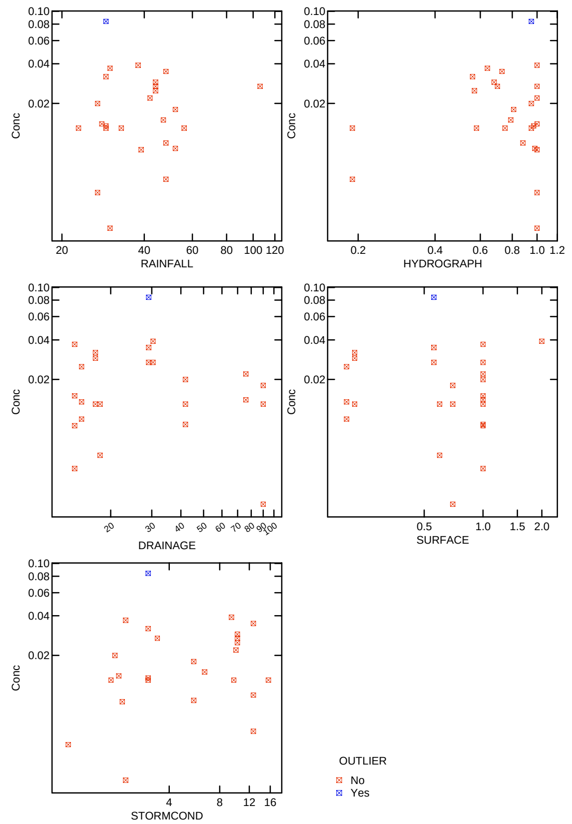
LOG-LOG SCALE



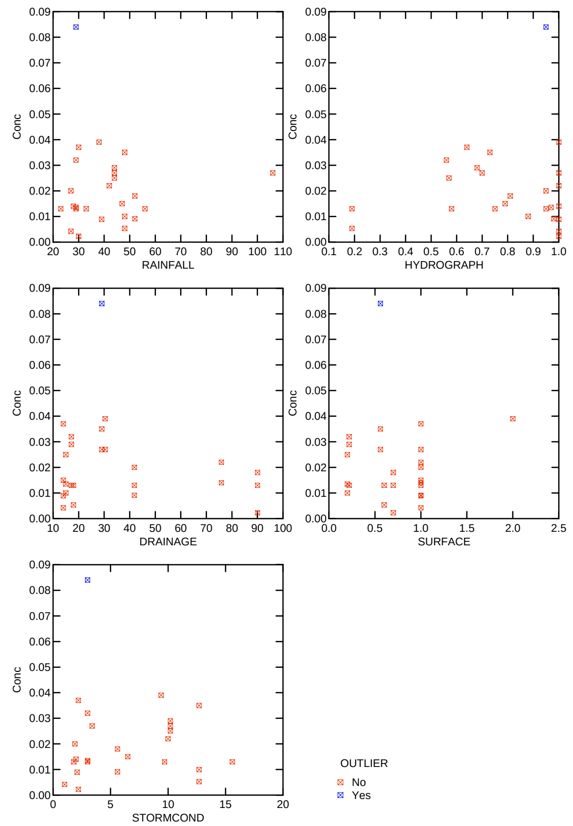

NORMAL SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND
OUTLIER
No
Yes

ORIGINAL REPRESENTATIVE HEAVY INDUSTRIAL Q-Q AND BOX PLOTS
ACENAPHTHYLENE, TOTAL

LOG-LOG SCALE

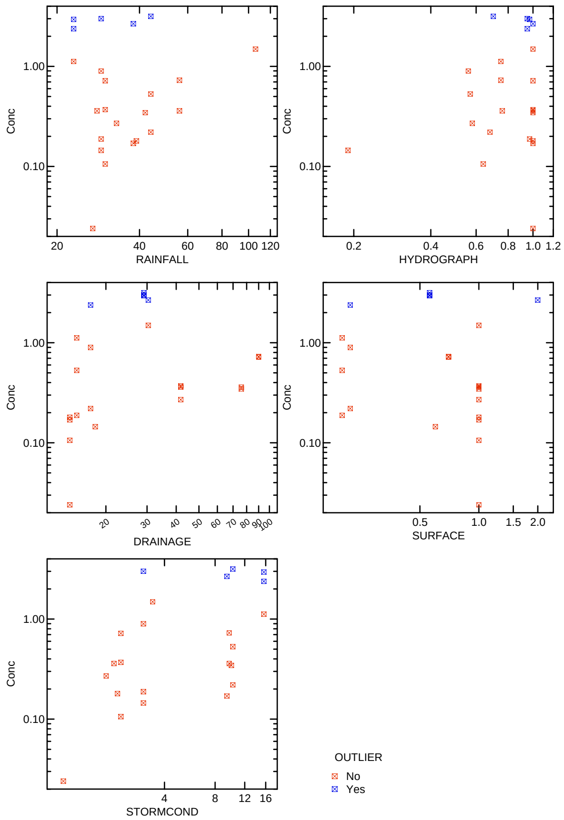


NORMAL SCALE

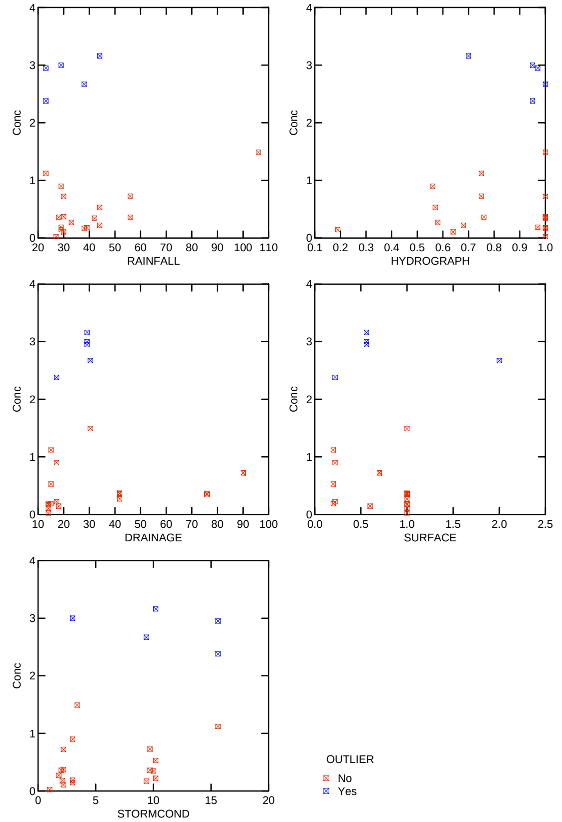


ARSENIC, DISSOLVED

LOG-LOG SCALE

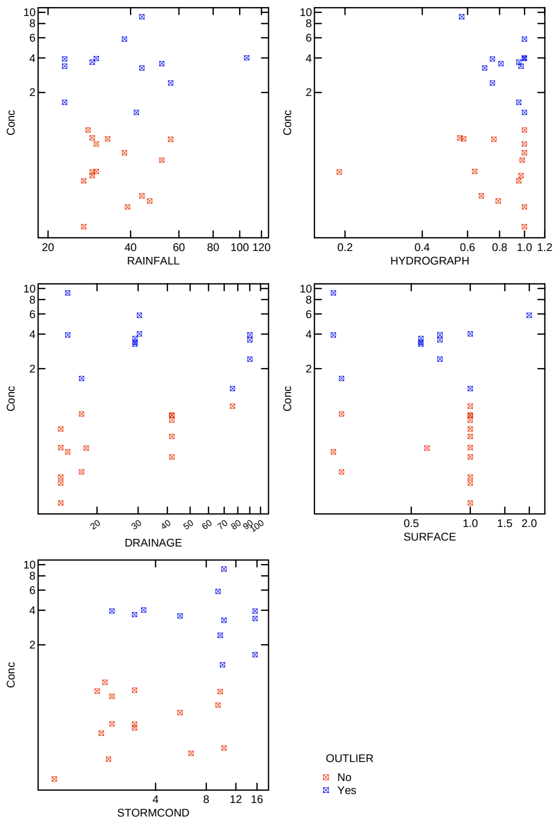


NORMAL SCALE

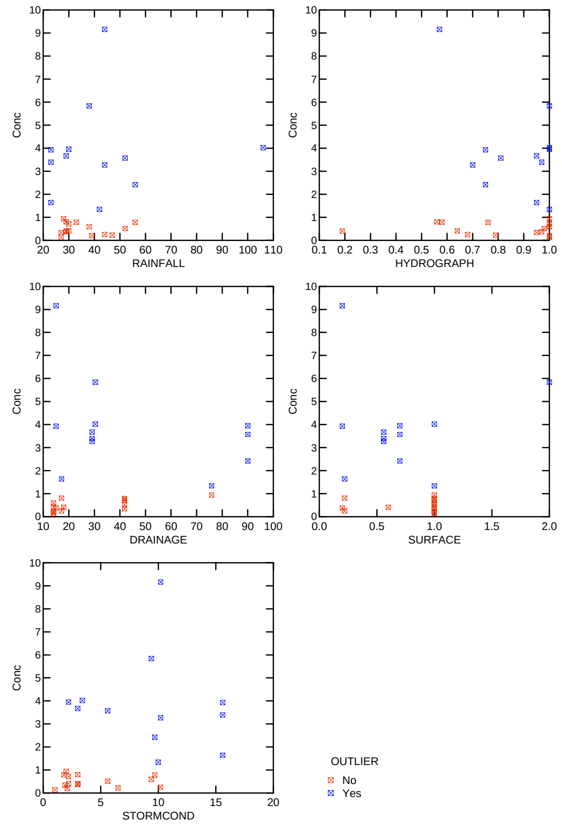


ARSENIC, TOTAL

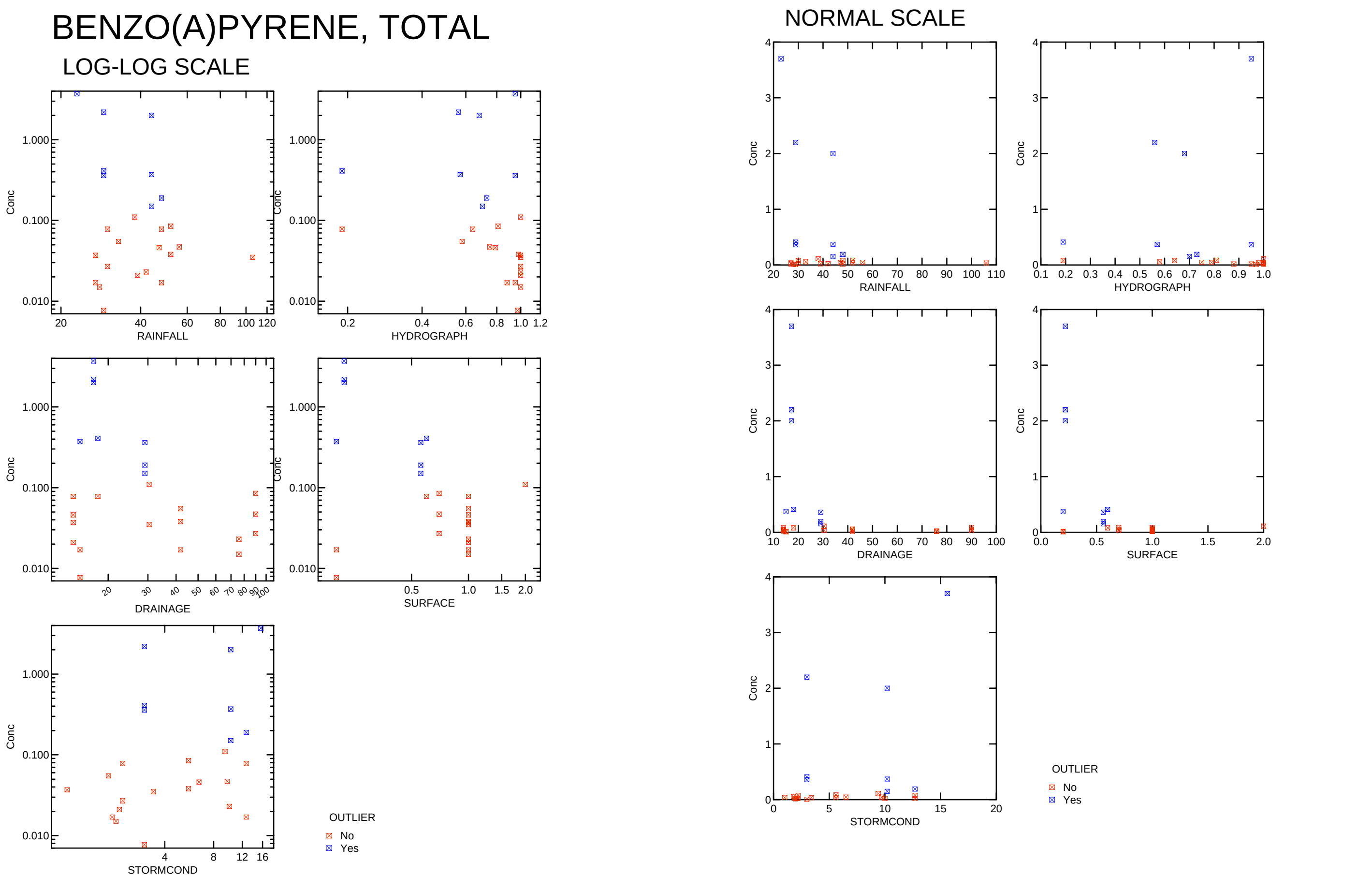
LOG-LOG SCALE



NORMAL SCALE

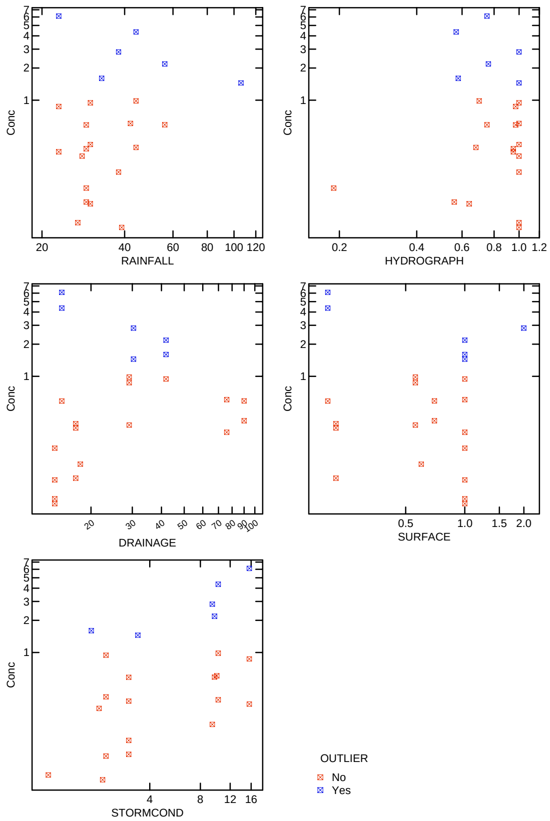


BENZO(A)PYRENE, TOTAL

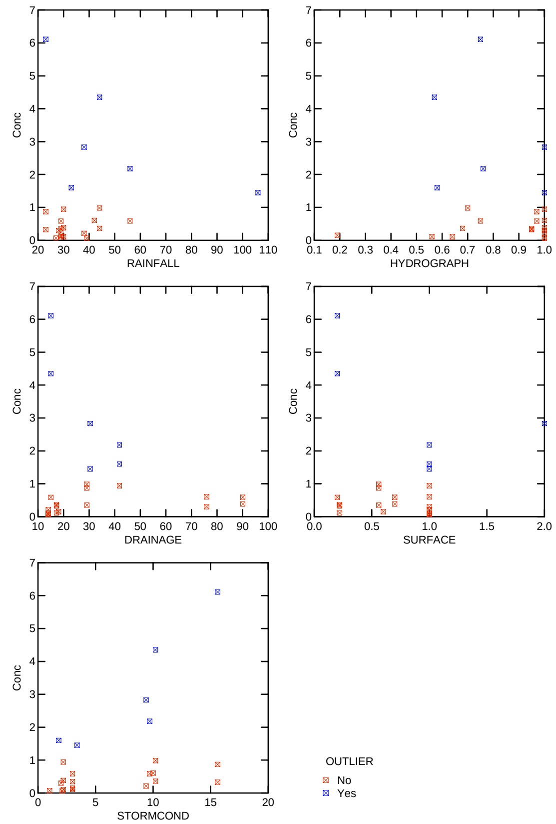


LEAD, DISSOLVED

LOG-LOG SCALE

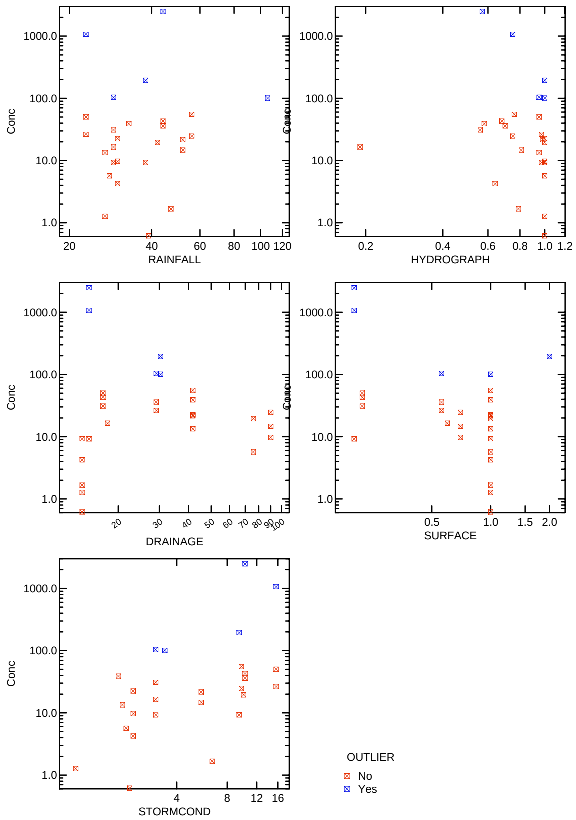


NORMAL SCALE

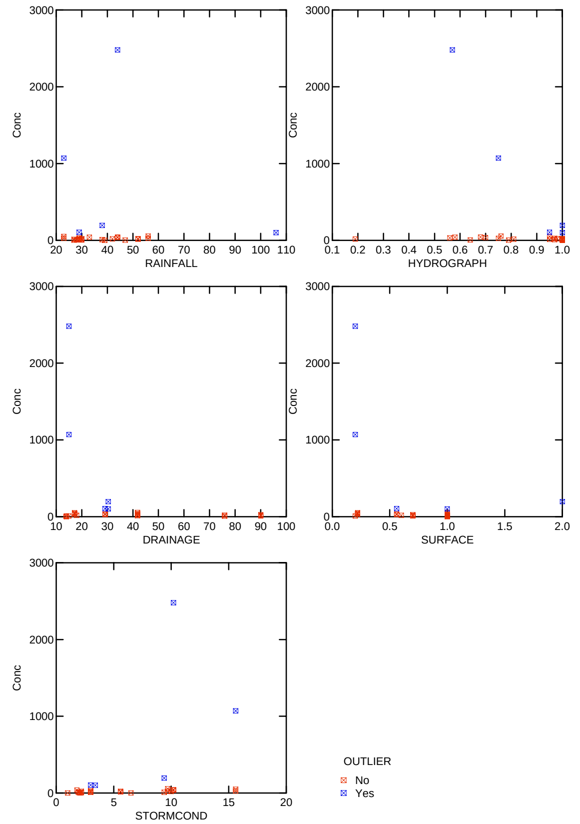


LEAD, TOTAL

LOG-LOG SCALE

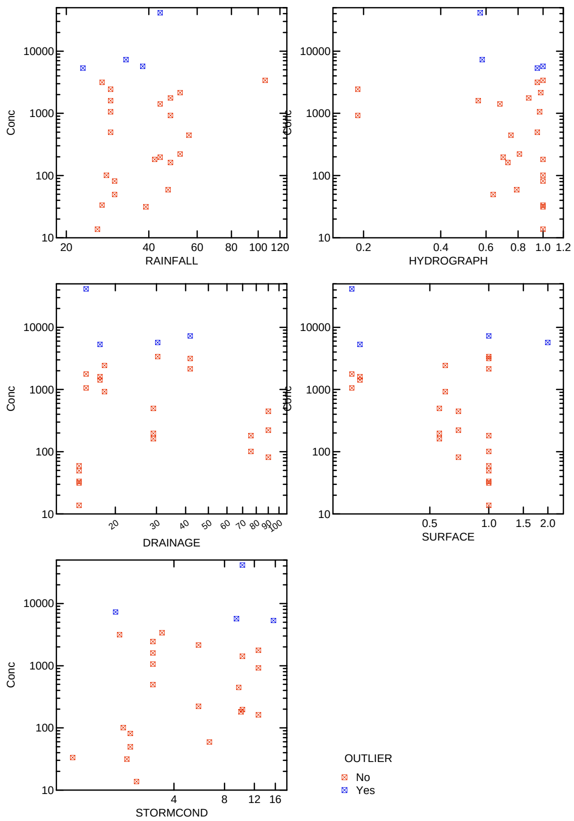


NORMAL SCALE

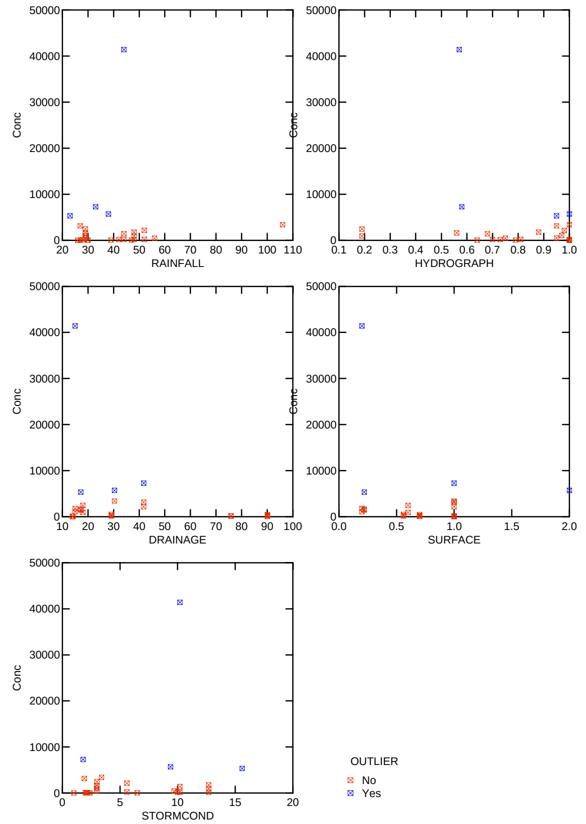


PCB-018, TOTAL

LOG-LOG SCALE

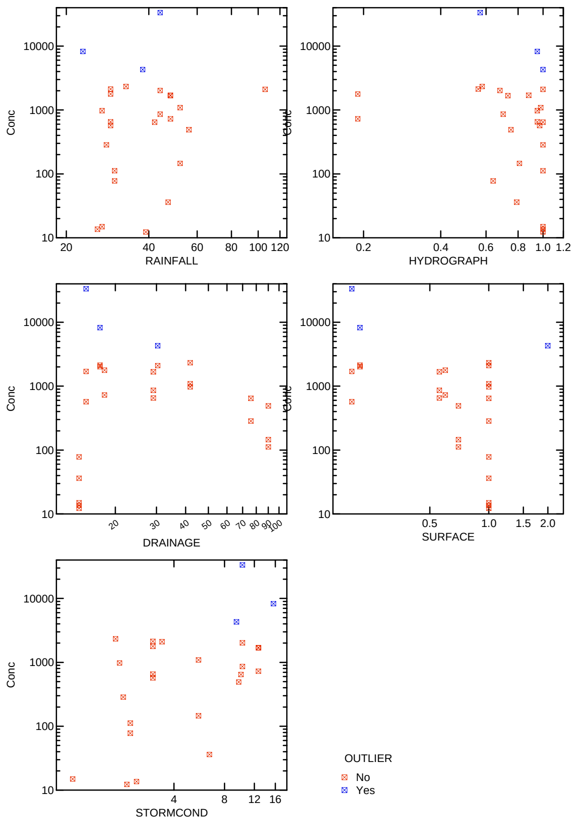


NORMAL SCALE

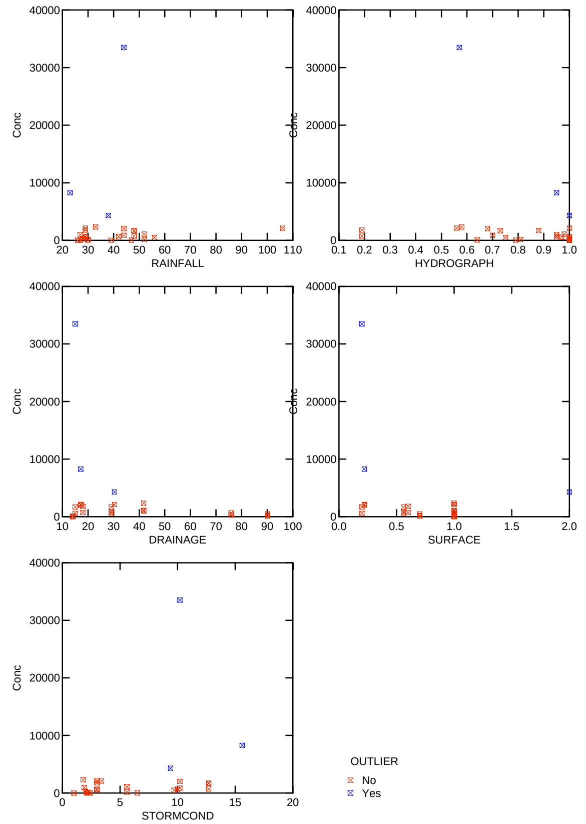


PCB-066, TOTAL

LOG-LOG SCALE

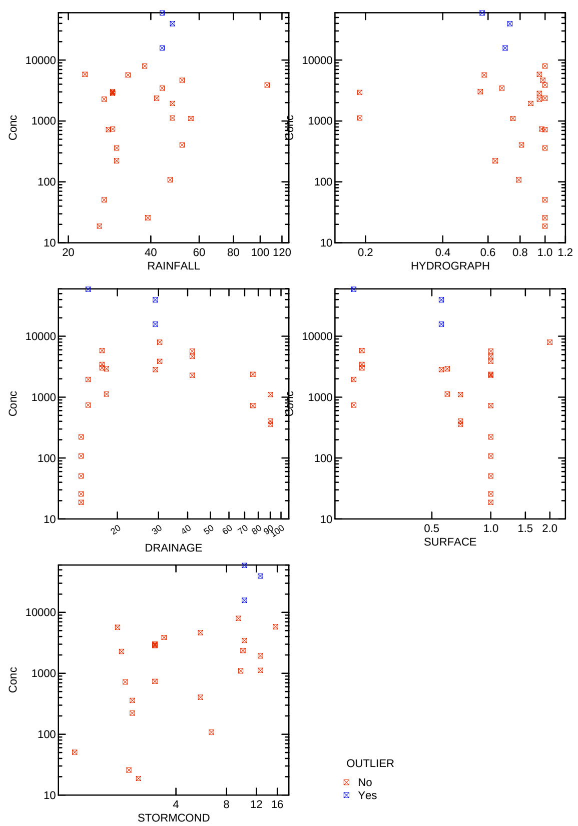


NORMAL SCALE

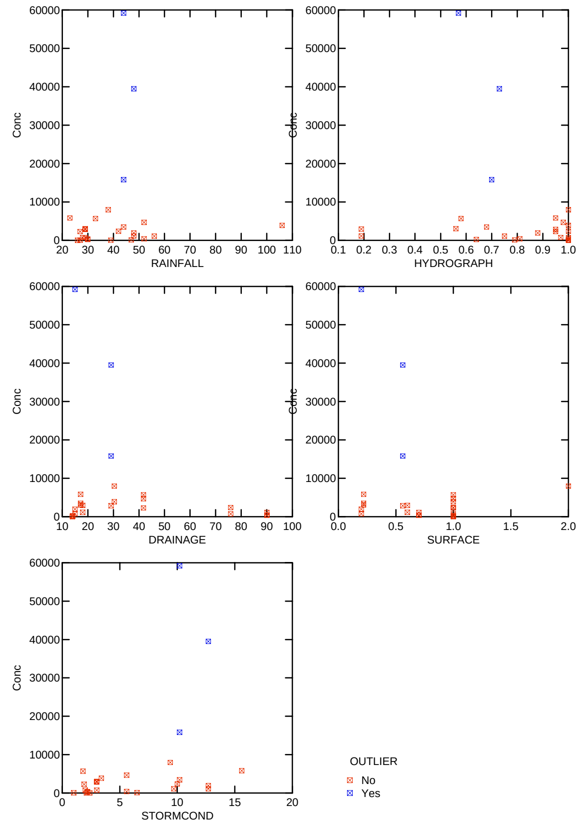


PCB-106, TOTAL

LOG-LOG SCALE

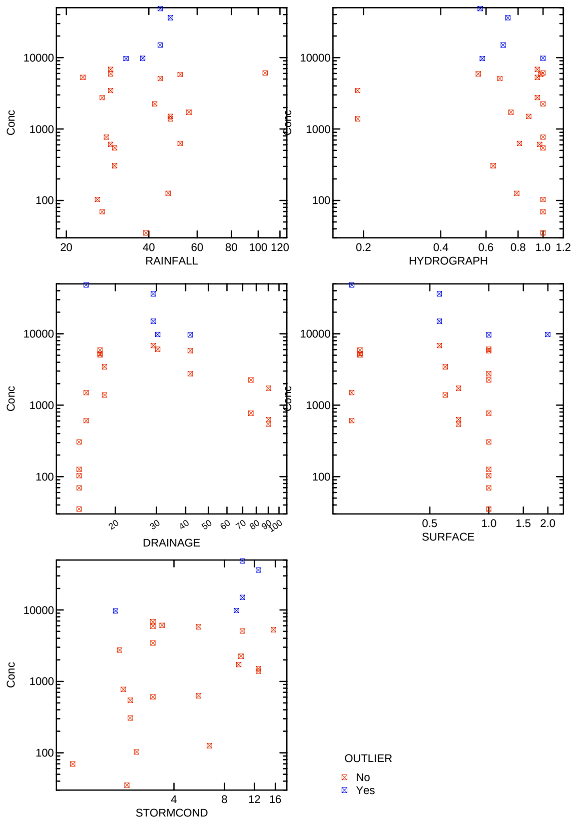


NORMAL SCALE

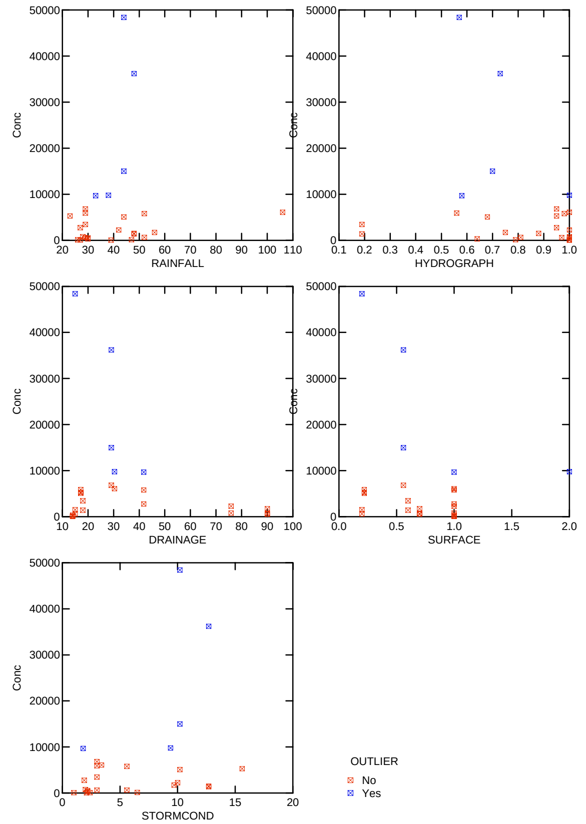


PCB-153, TOTAL

LOG-LOG SCALE

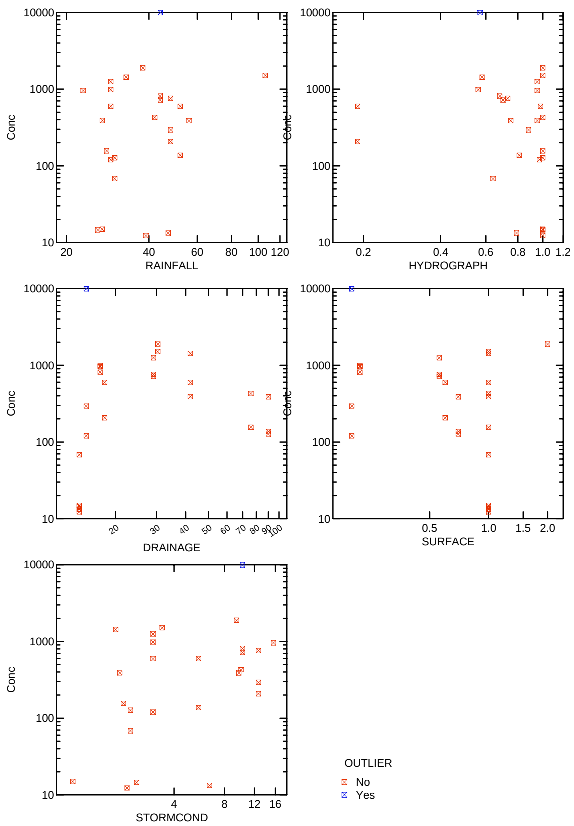


NORMAL SCALE

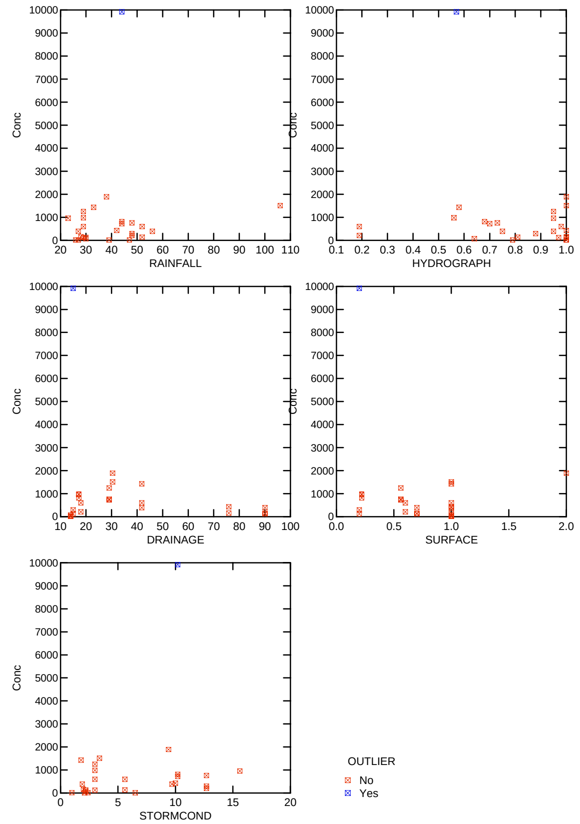


PCB-194, TOTAL

LOG-LOG SCALE

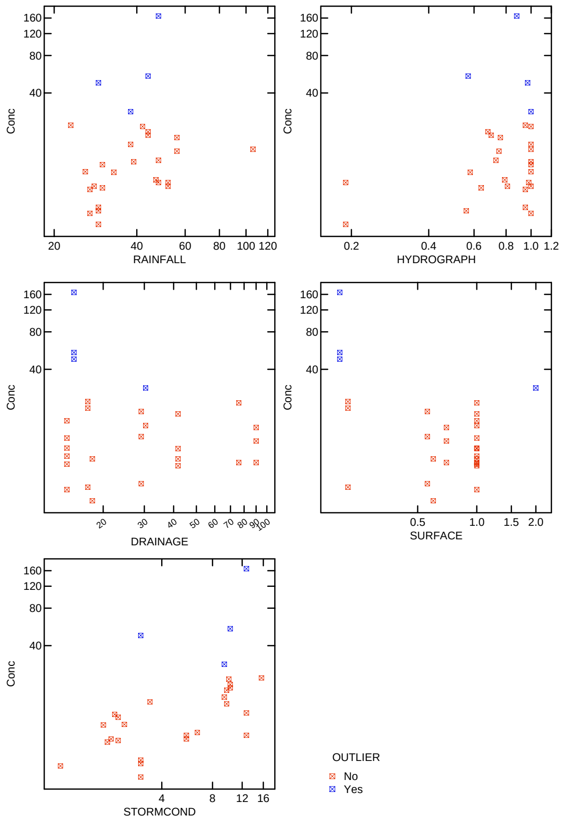


NORMAL SCALE

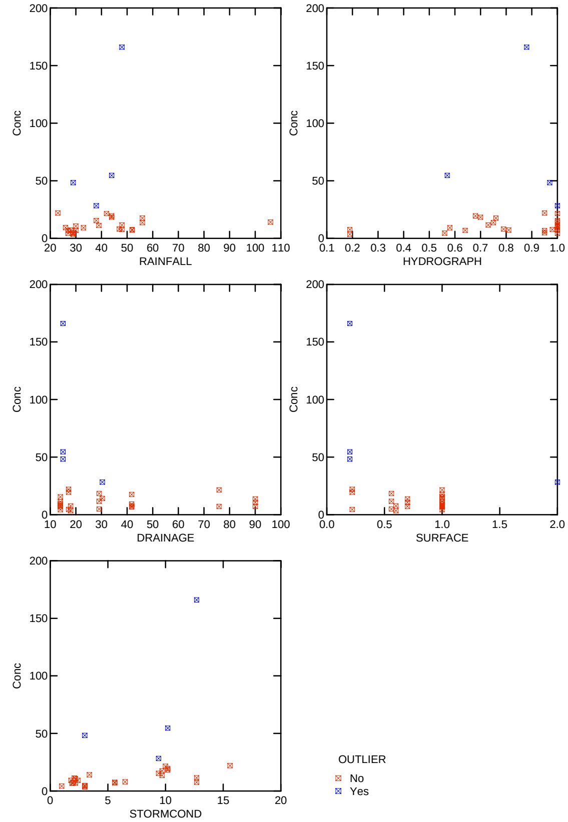


TOC

LOG-LOG SCALE

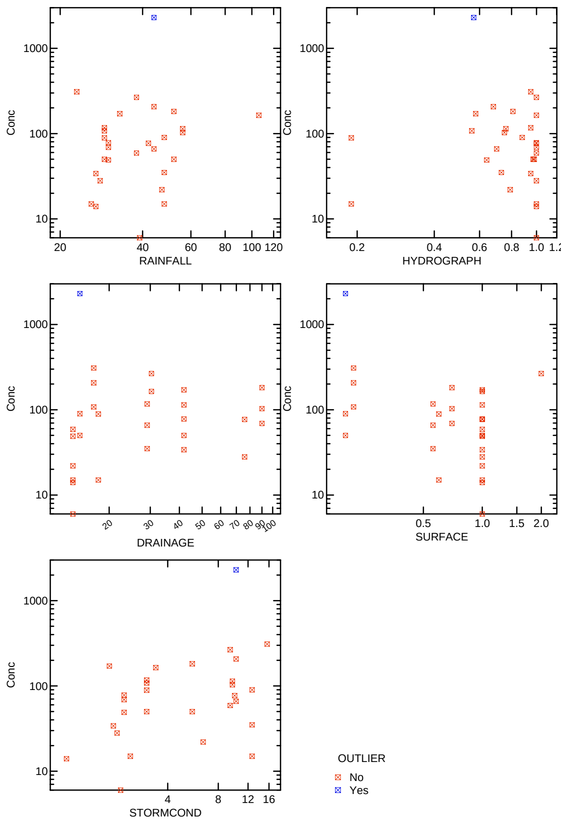


NORMAL SCALE

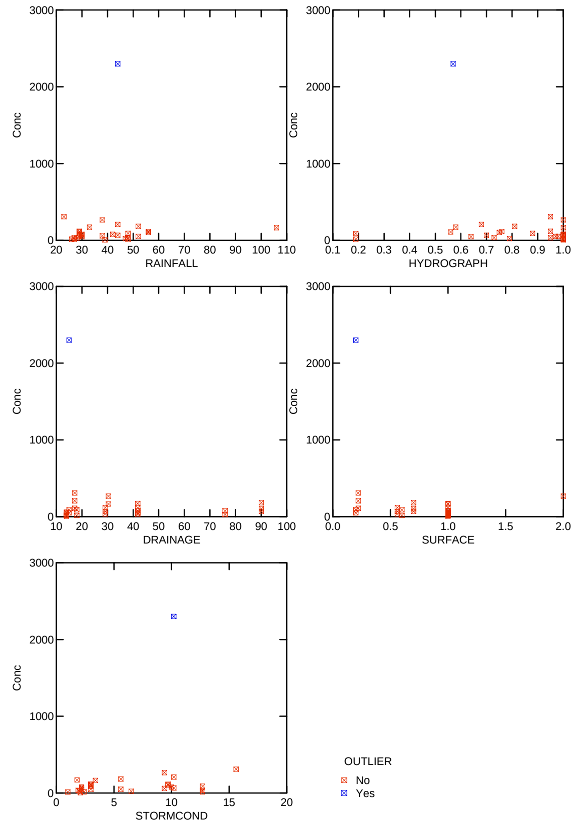


TSS

LOG-LOG SCALE

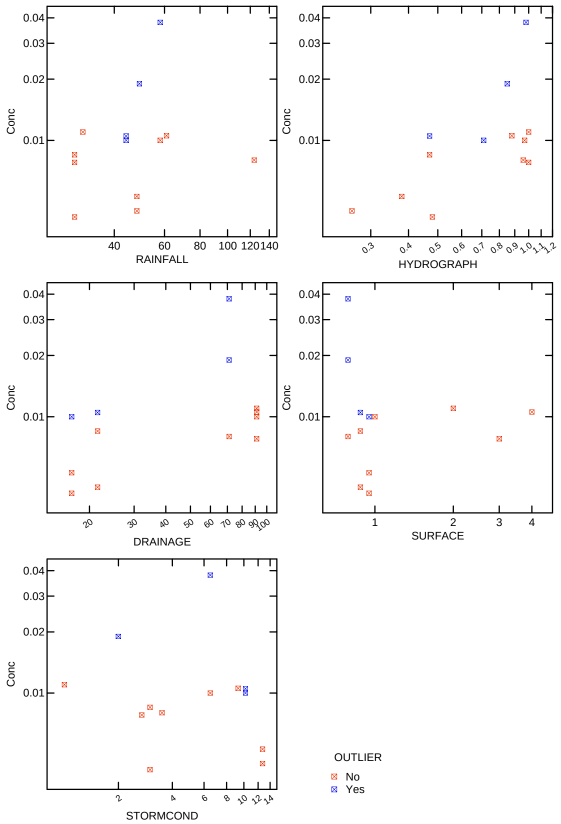


NORMAL SCALE

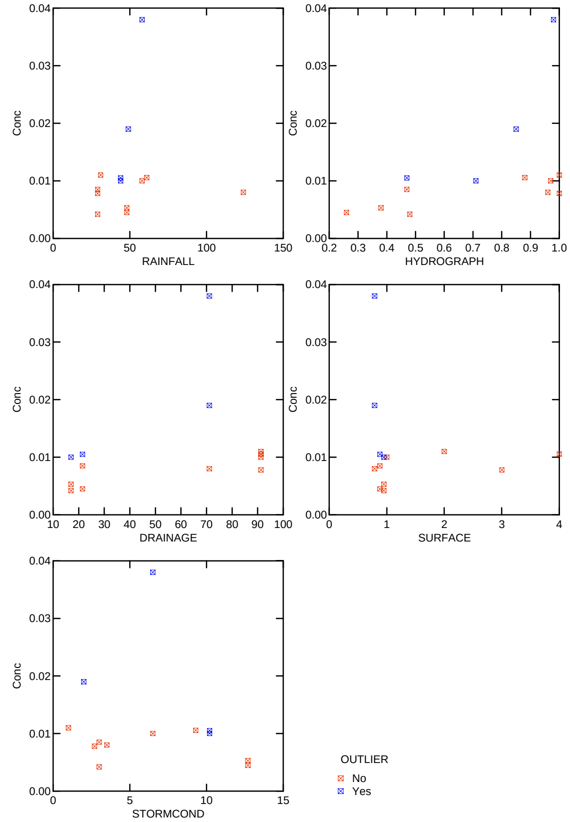


ORIGINAL REPRESENTATIVE LIGHT INDUSTRIAL Q-Q AND BOX PLOTS
ACENAPHTHYLENE, TOTAL

LOG-LOG SCALE

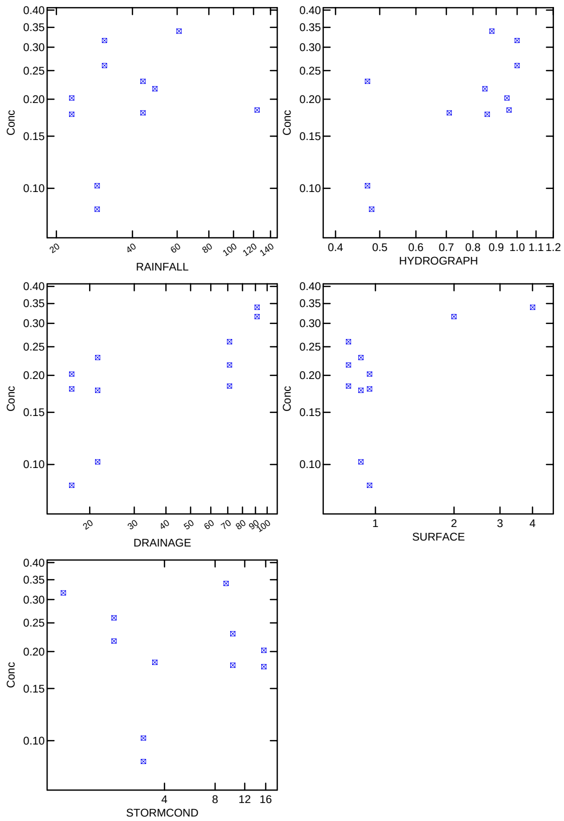


NORMAL SCALE

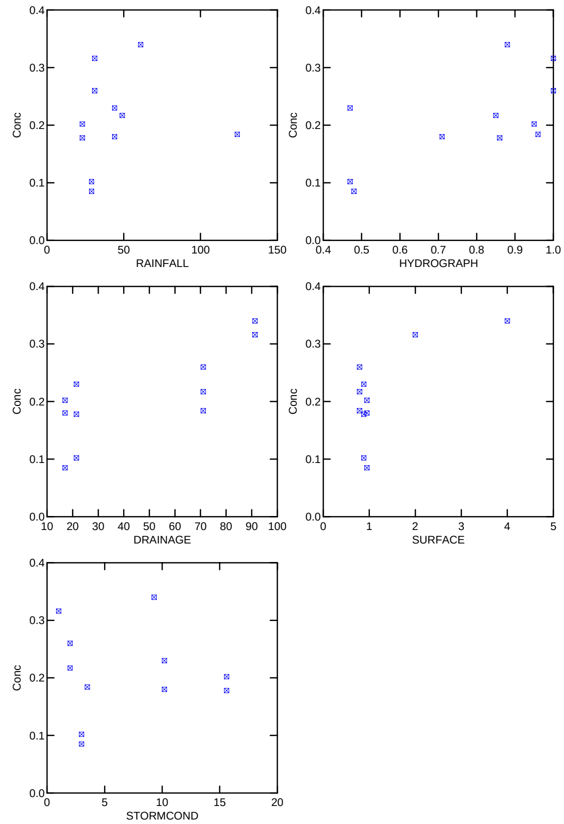


ARSENIC, DISSOLVED

LOG-LOG SCALE

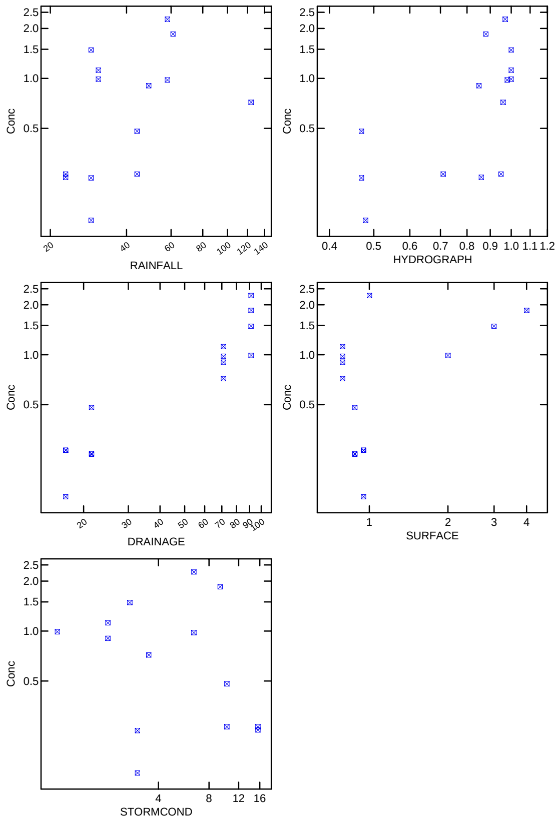


NORMAL SCALE

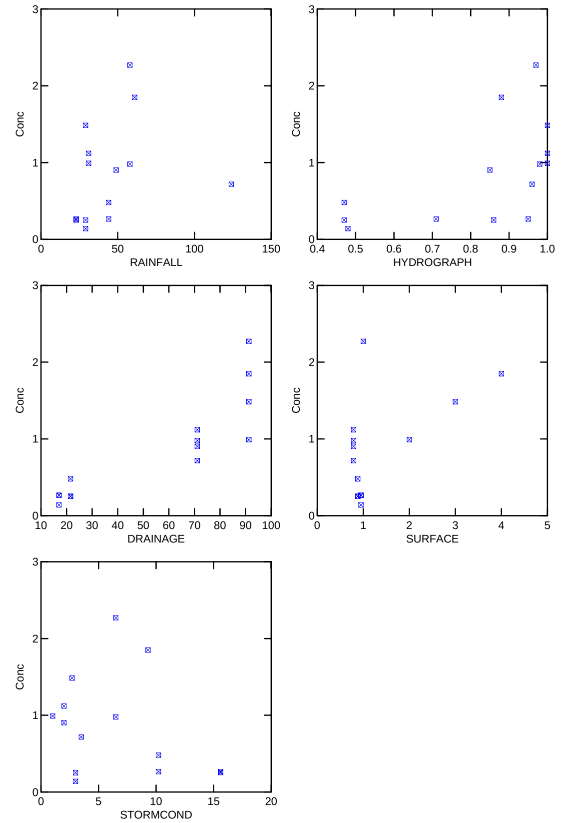


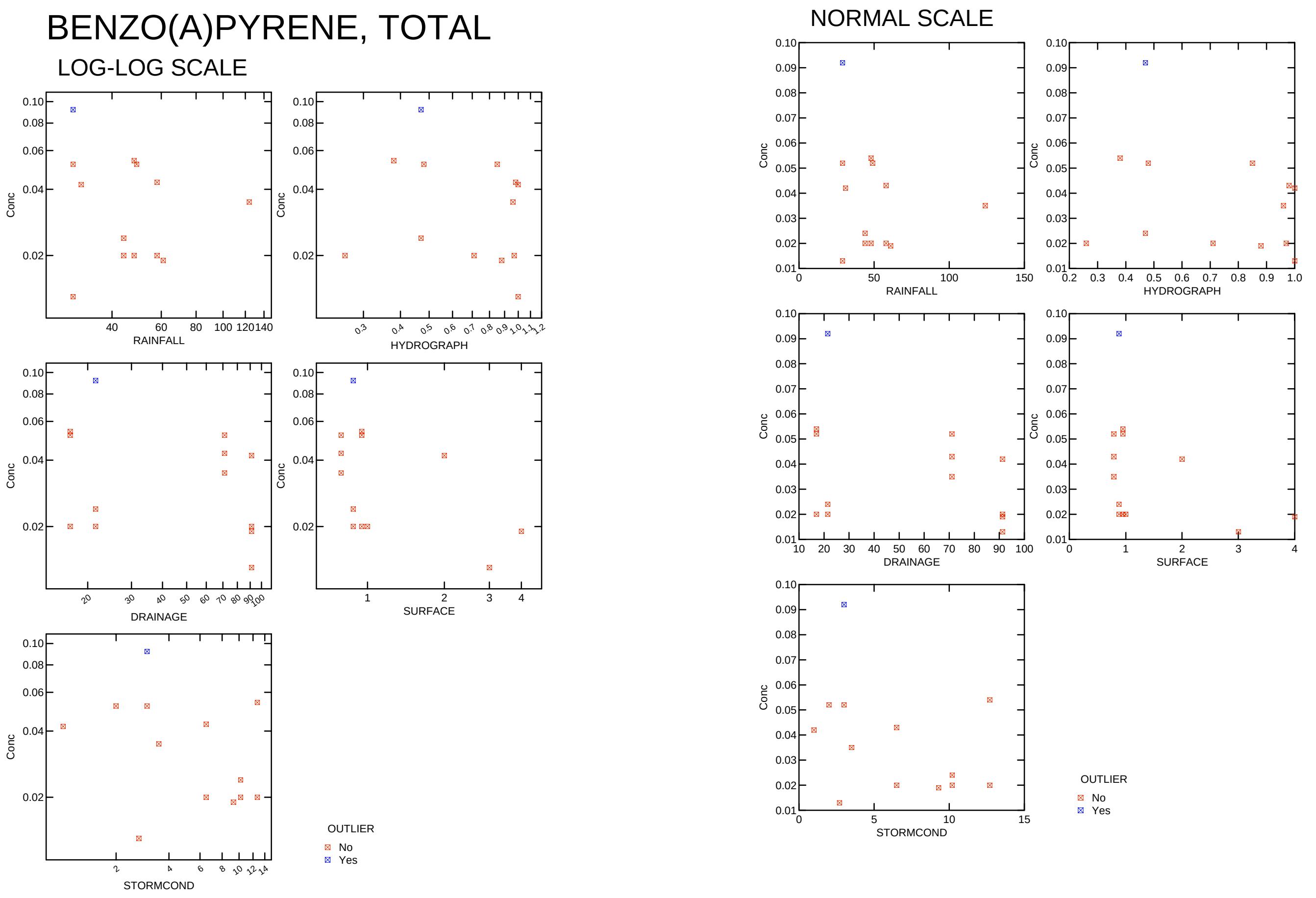
ARSENIC, TOTAL

LOG-LOG SCALE



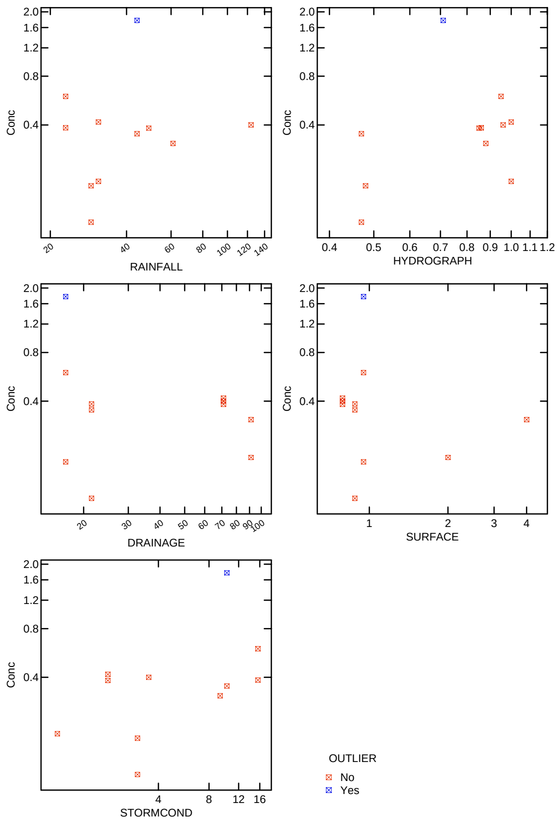
NORMAL SCALE



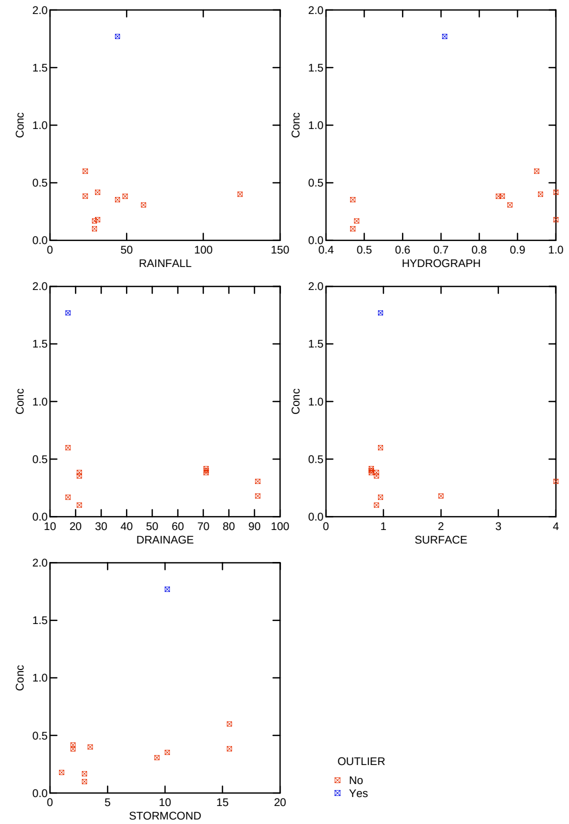

BENZO(A)PYRENE, TOTAL
LOG-LOG SCALE
NORMAL SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND
OUTLIER
No
Yes

LEAD, DISSOLVED

LOG-LOG SCALE

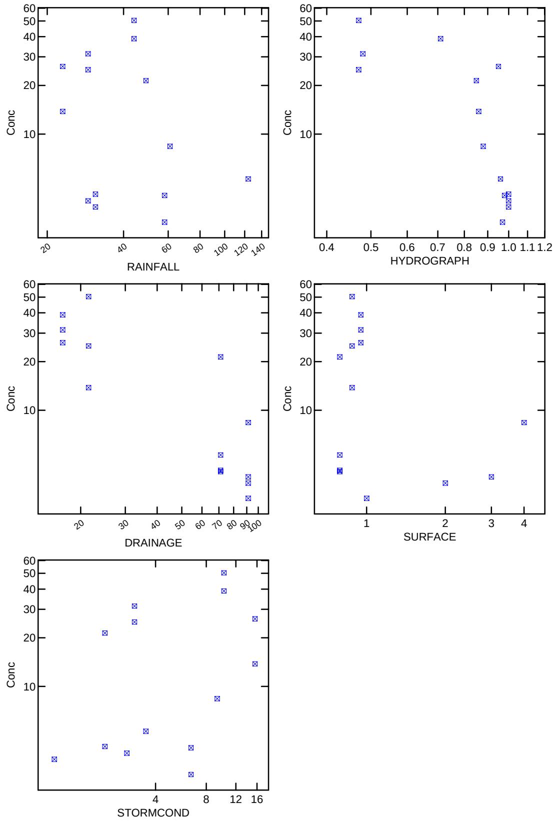


NORMAL SCALE

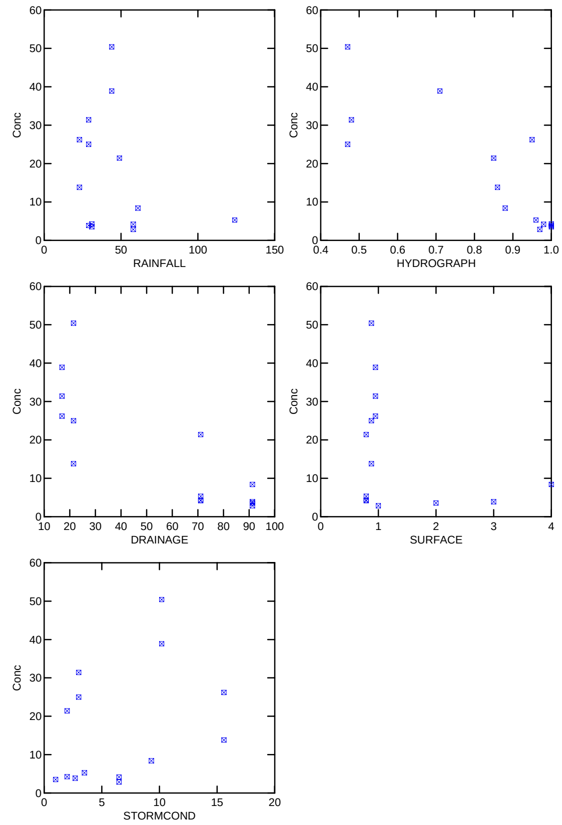


LEAD, TOTAL

LOG-LOG SCALE

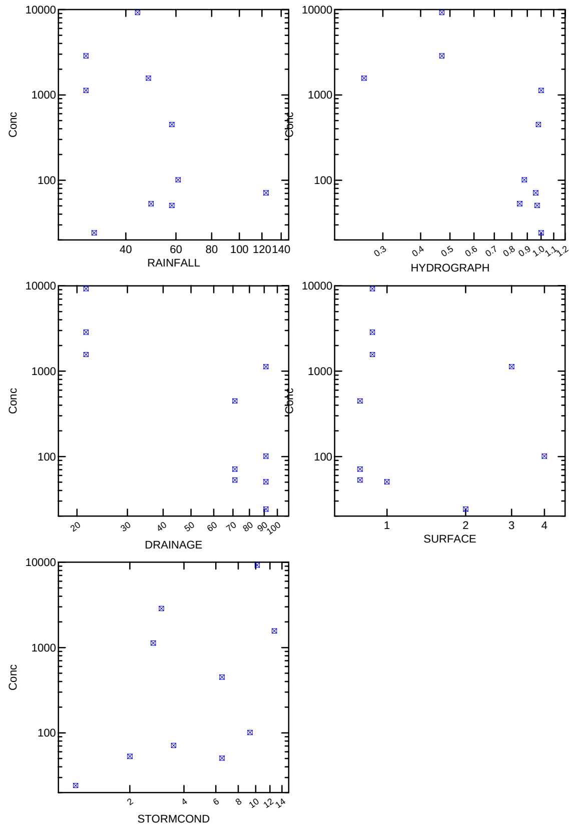


NORMAL SCALE

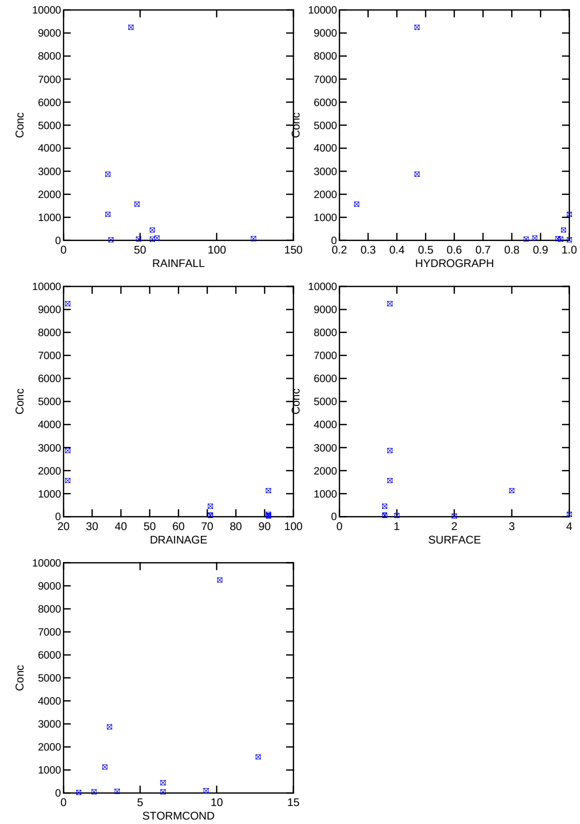


PCB-018, TOTAL

LOG-LOG SCALE

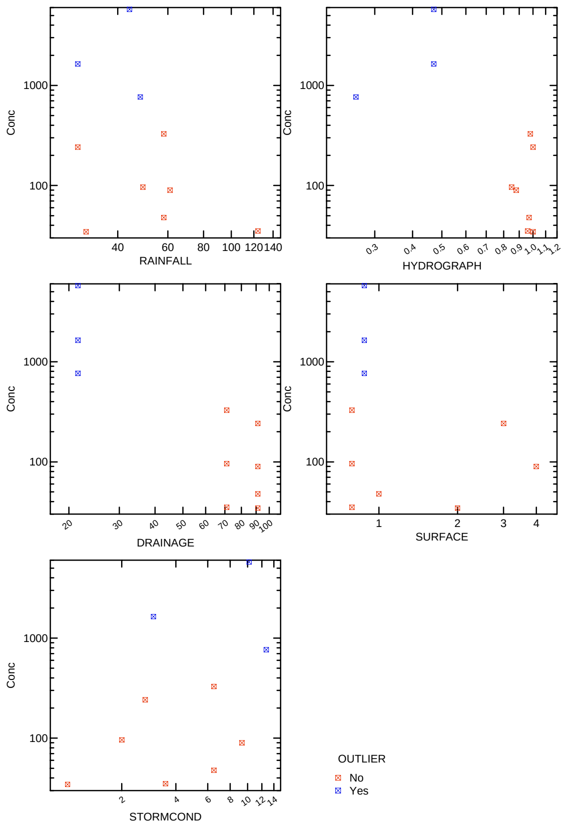


NORMAL SCALE

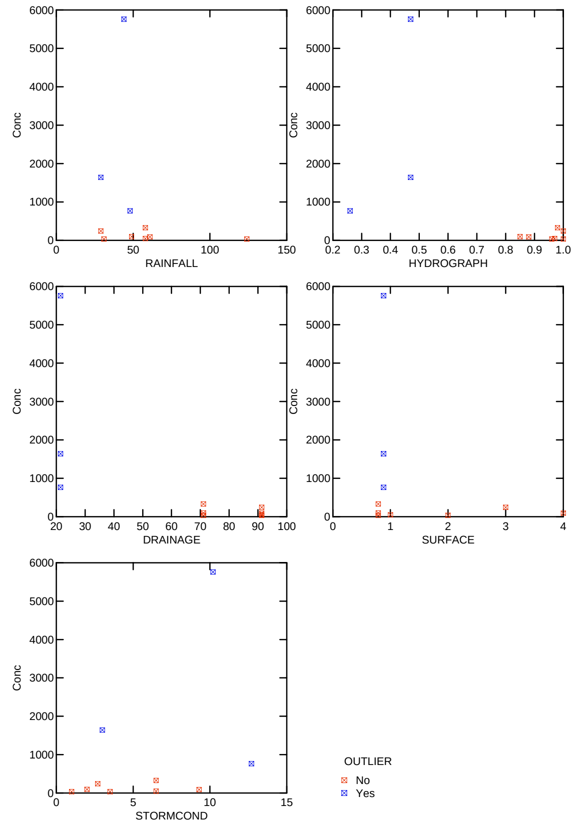


PCB-066, TOTAL

LOG-LOG SCALE

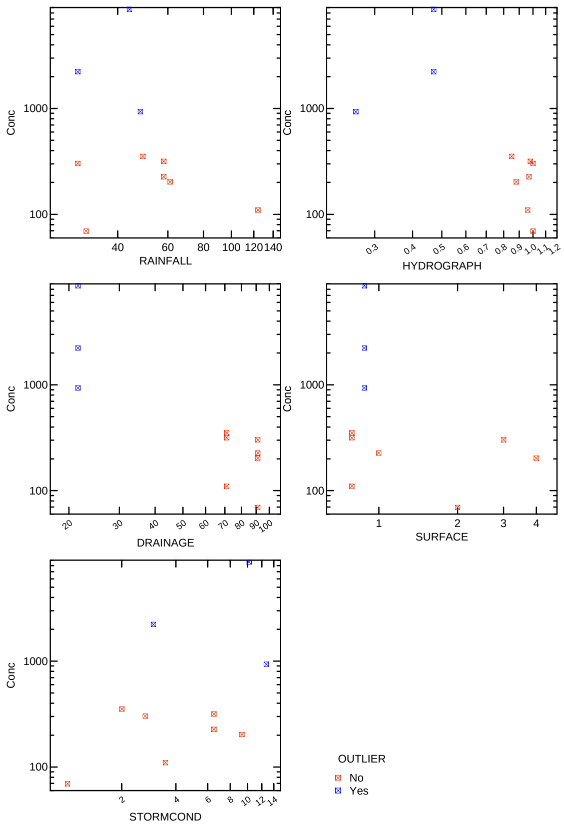


NORMAL SCALE

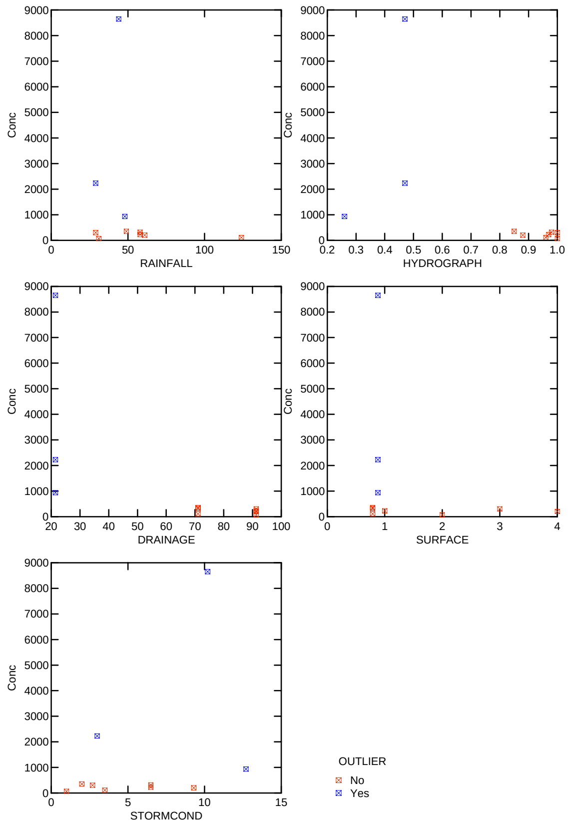


PCB-106, TOTAL

LOG-LOG SCALE

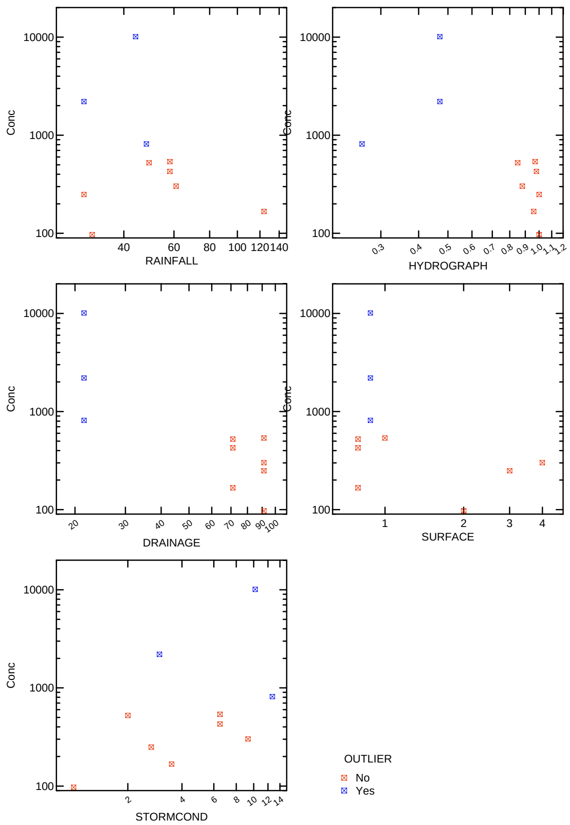


NORMAL SCALE

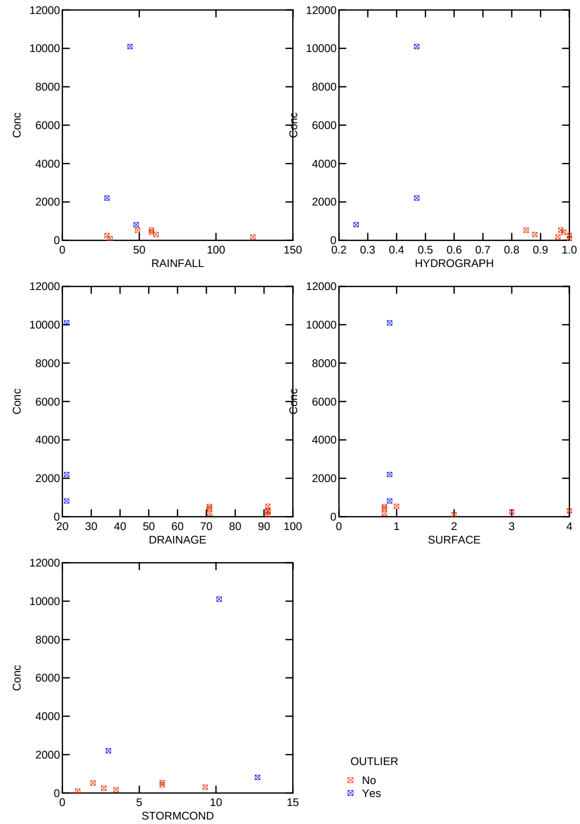


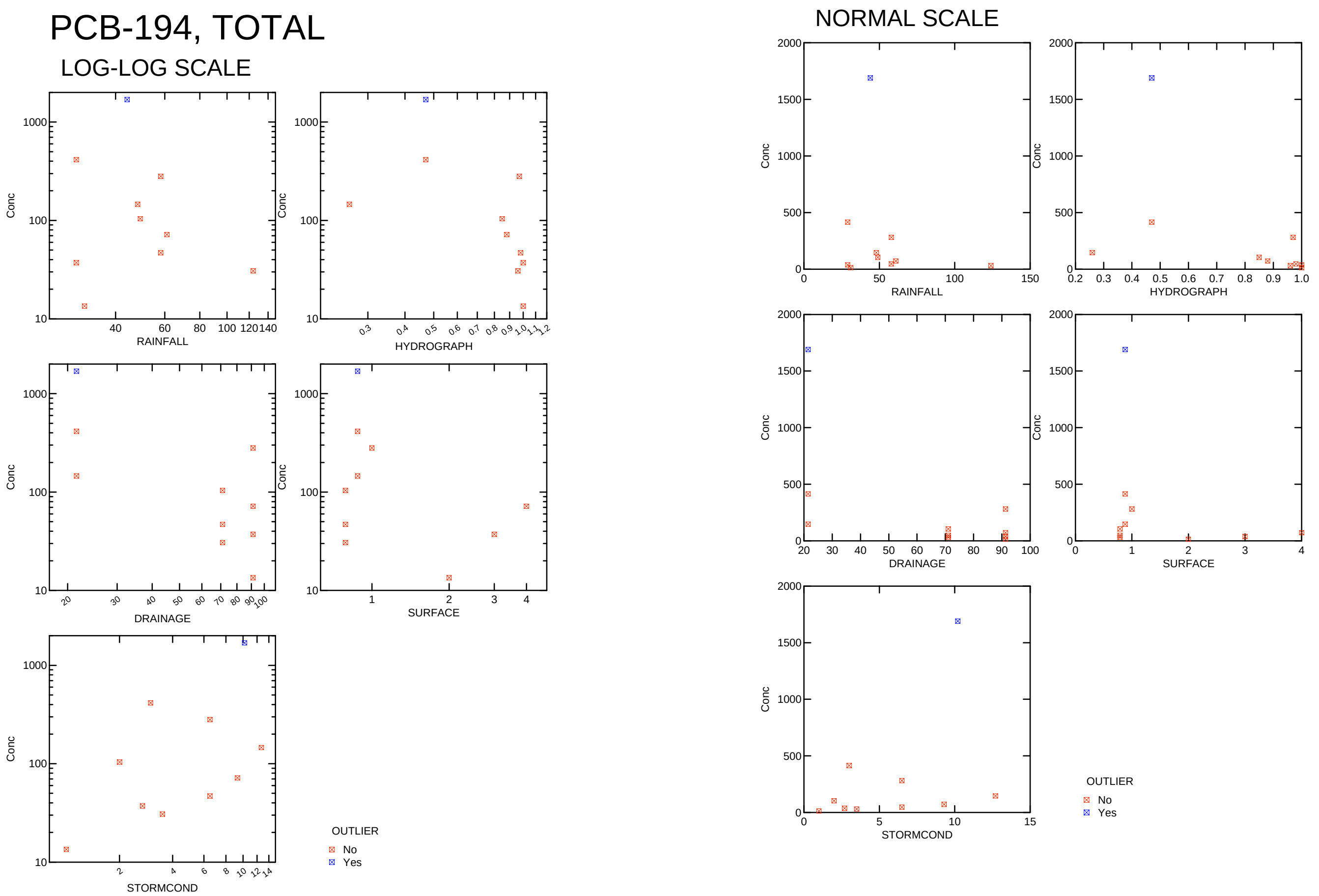
PCB-153, TOTAL

LOG-LOG SCALE

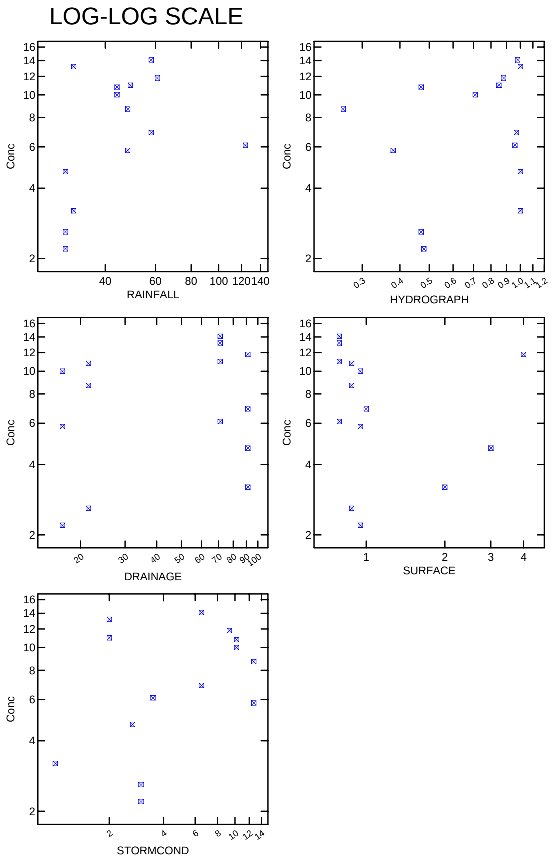


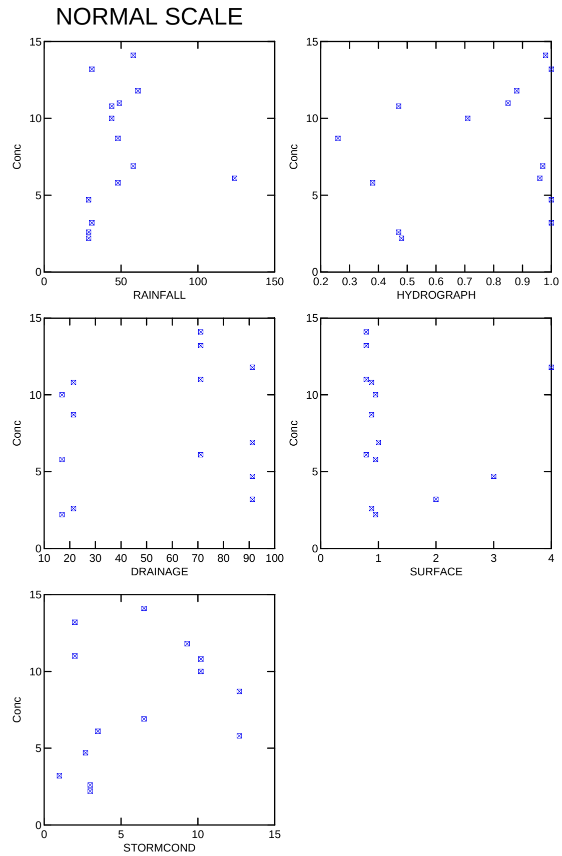
NORMAL SCALE



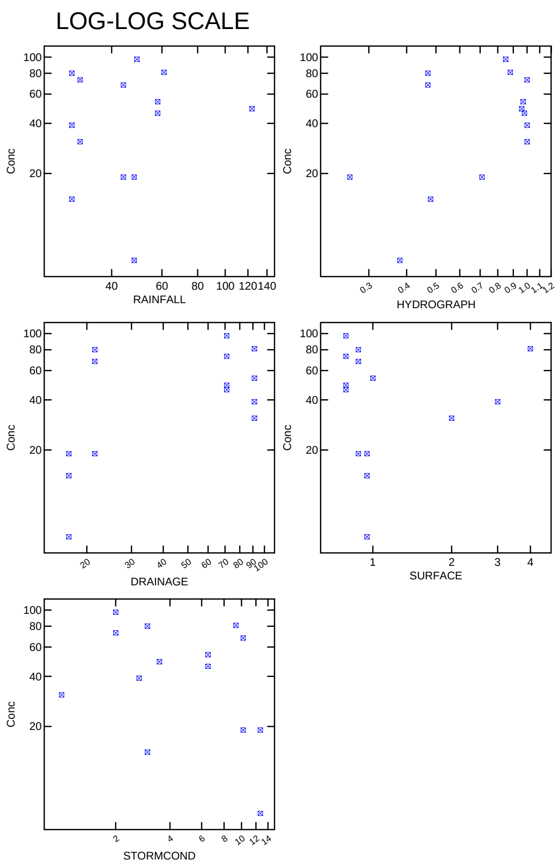

PCB-194, TOTAL
LOG-LOG SCALE
NORMAL SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND
OUTLIER
No
Yes

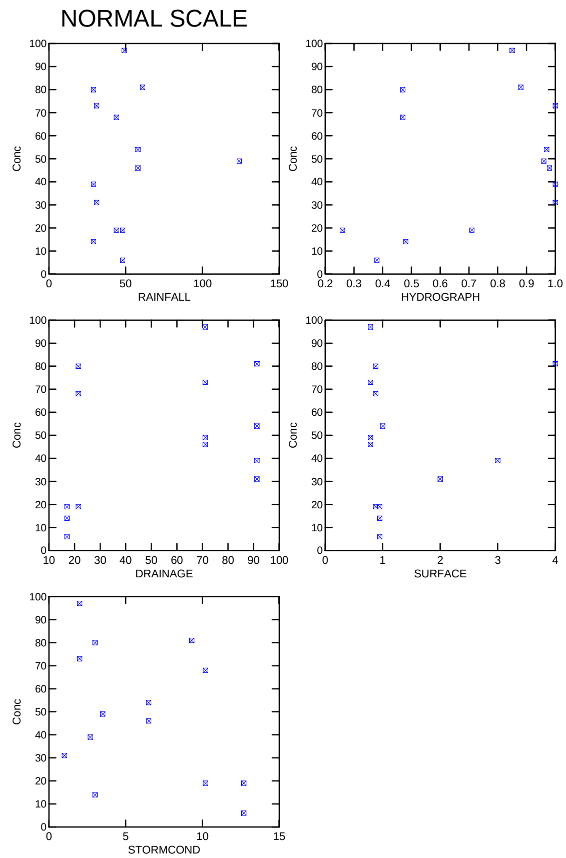
TOC


LOG-LOG SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND


NORMAL SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND

TSS

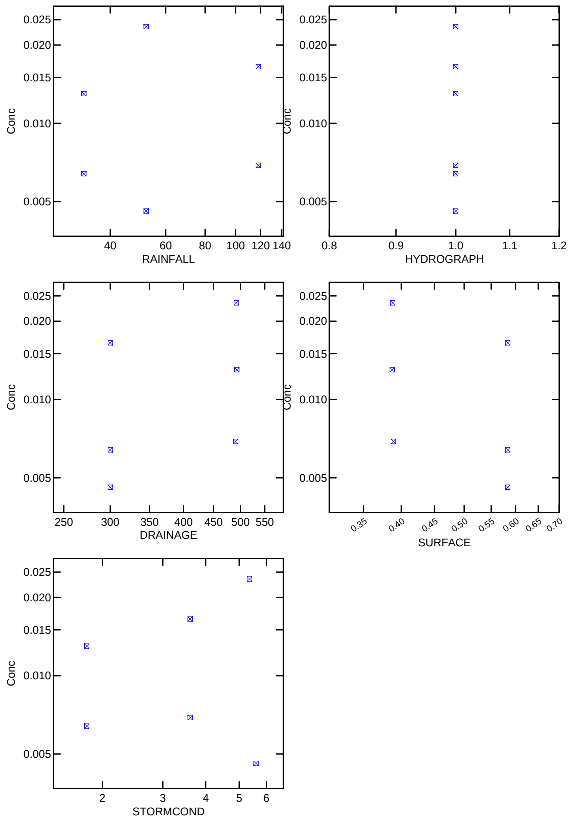

LOG-LOG SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND


NORMAL SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND

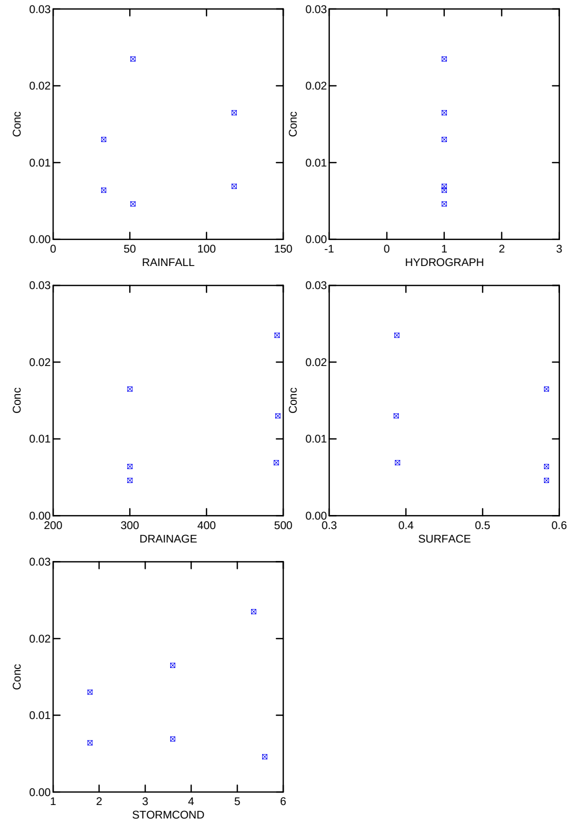
ORIGINAL COMBINED LAND USE OPEN/HEAVY INDUSTRIAL Q-Q AND BOX PLOTS

ACENAPHTHYLENE, TOTAL

LOG-LOG SCALE

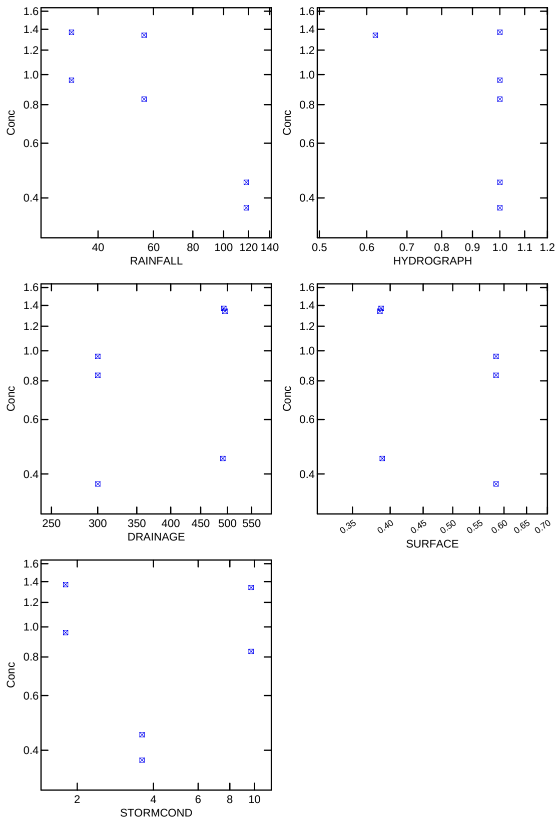


NORMAL SCALE

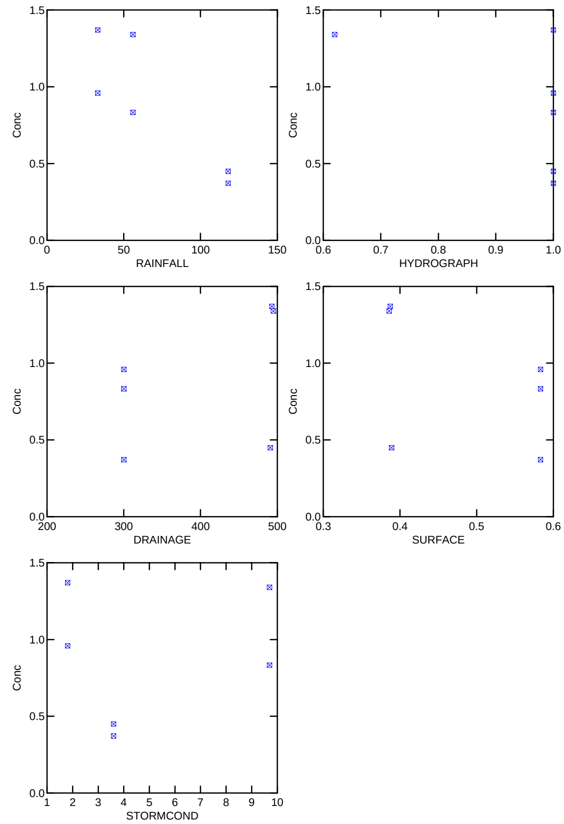


ARSENIC, DISSOLVED

LOG-LOG SCALE

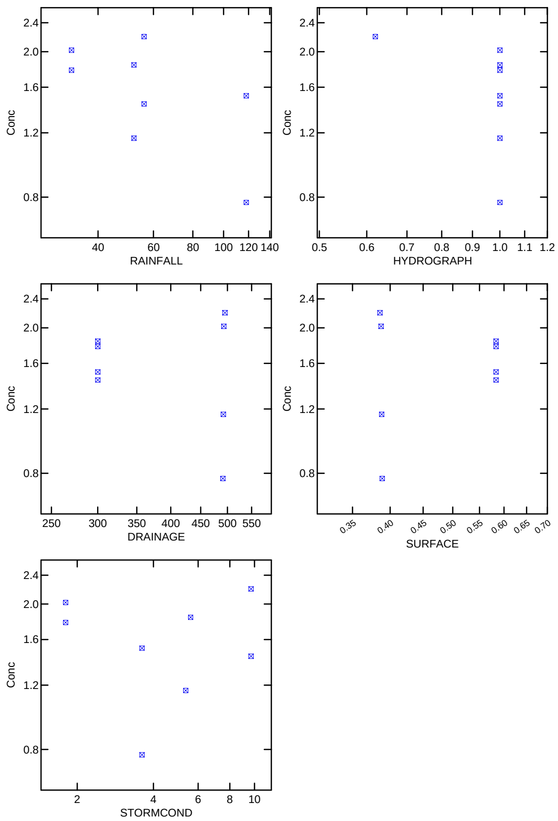


NORMAL SCALE

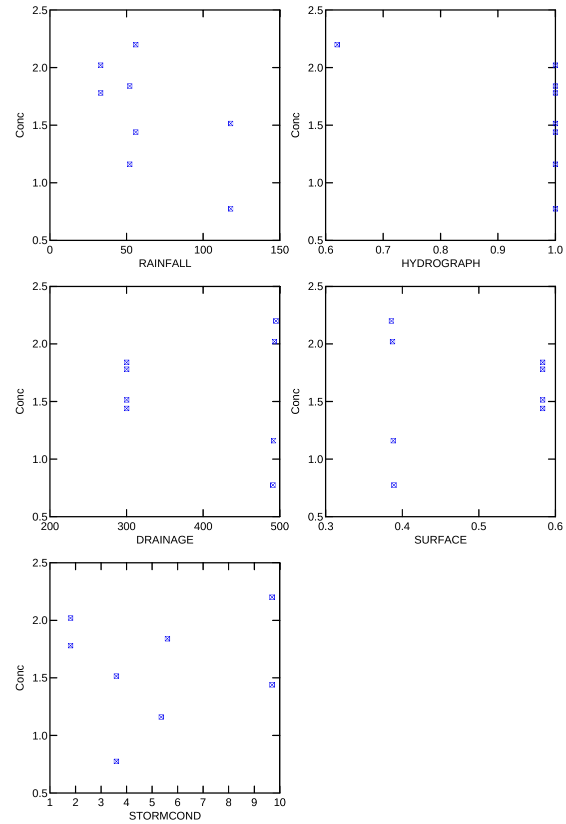


ARSENIC, TOTAL

LOG-LOG SCALE

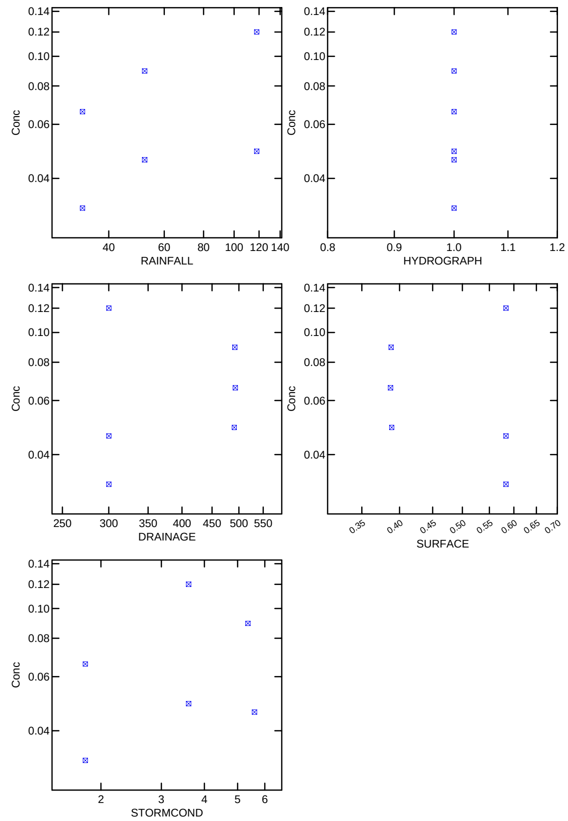


NORMAL SCALE

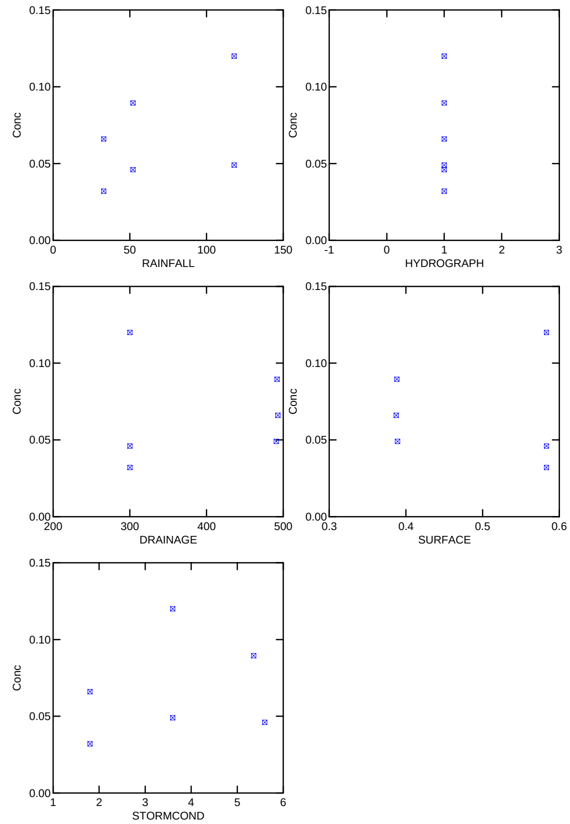


BENZO(A)PYRENE, TOTAL

LOG-LOG SCALE

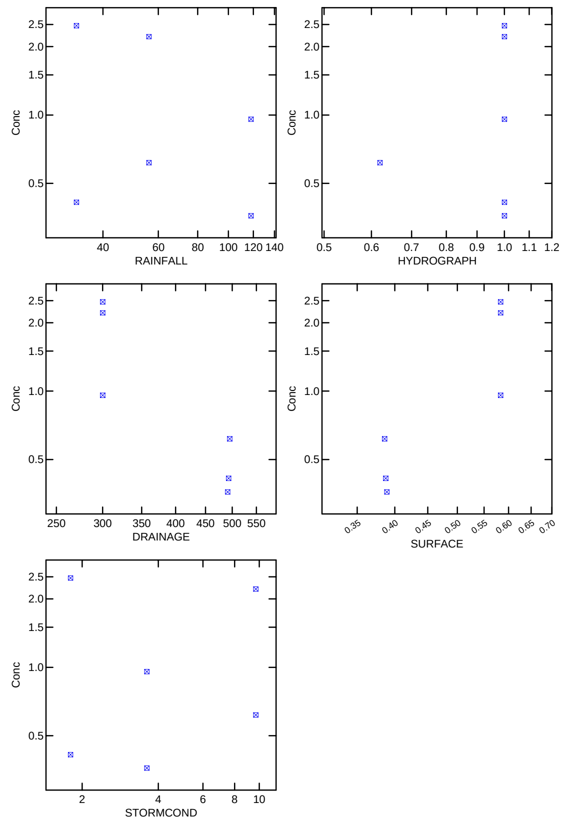


NORMAL SCALE

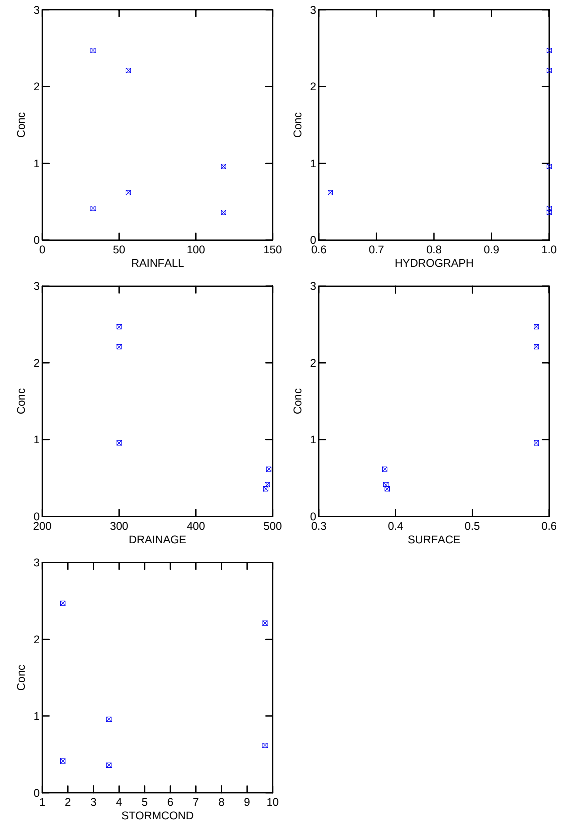


LEAD, DISSOLVED

LOG-LOG SCALE

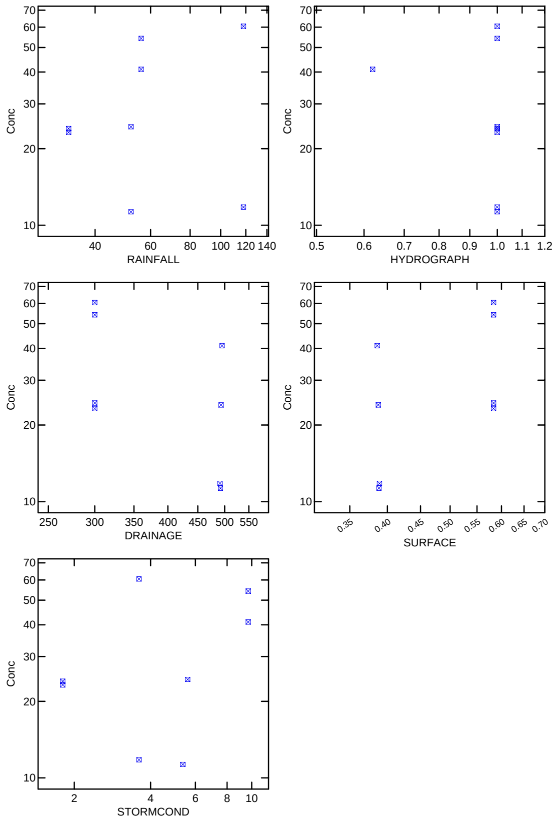


NORMAL SCALE

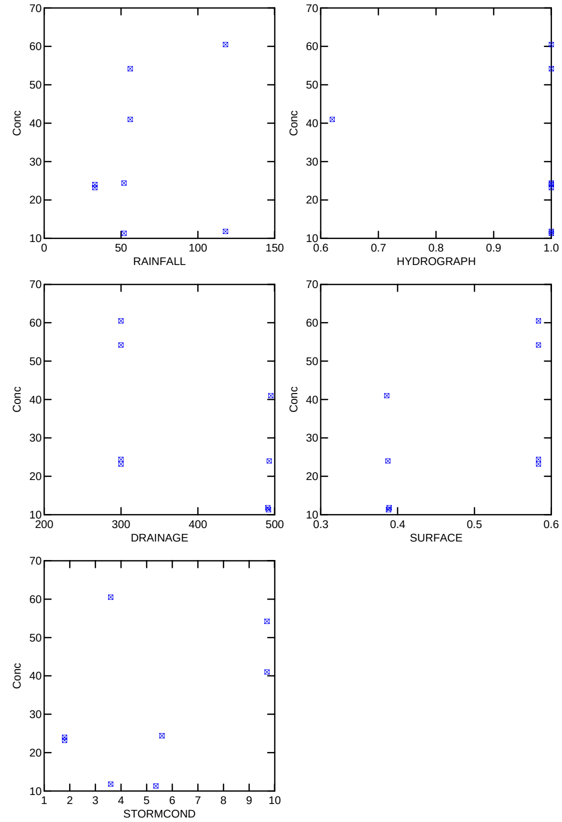


LEAD, TOTAL

LOG-LOG SCALE

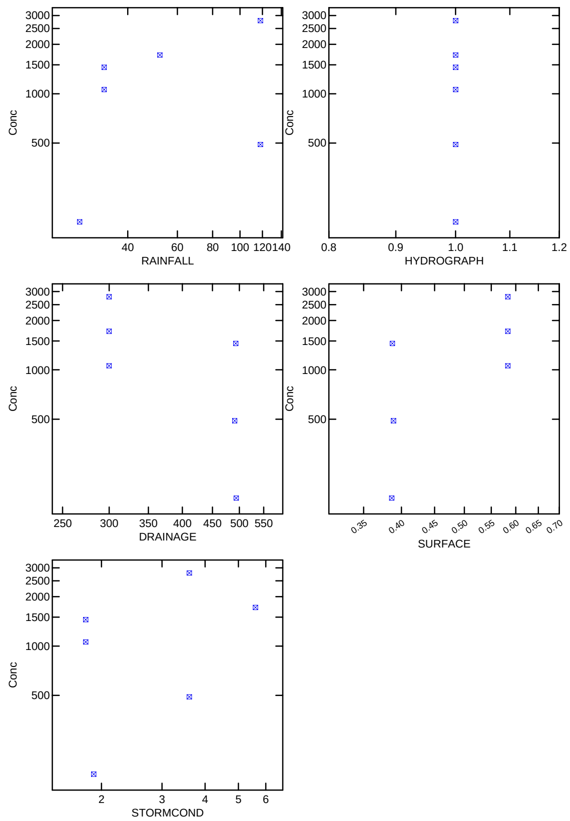


NORMAL SCALE

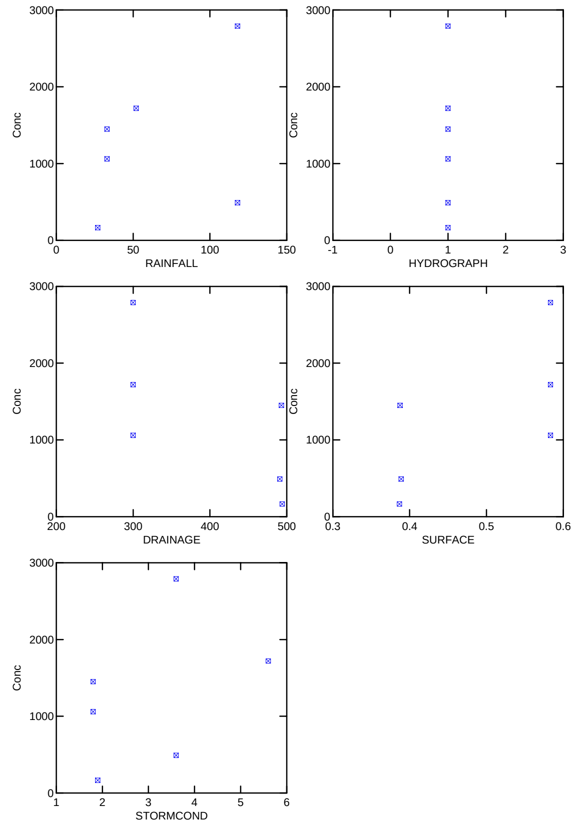


PCB-018, TOTAL

LOG-LOG SCALE

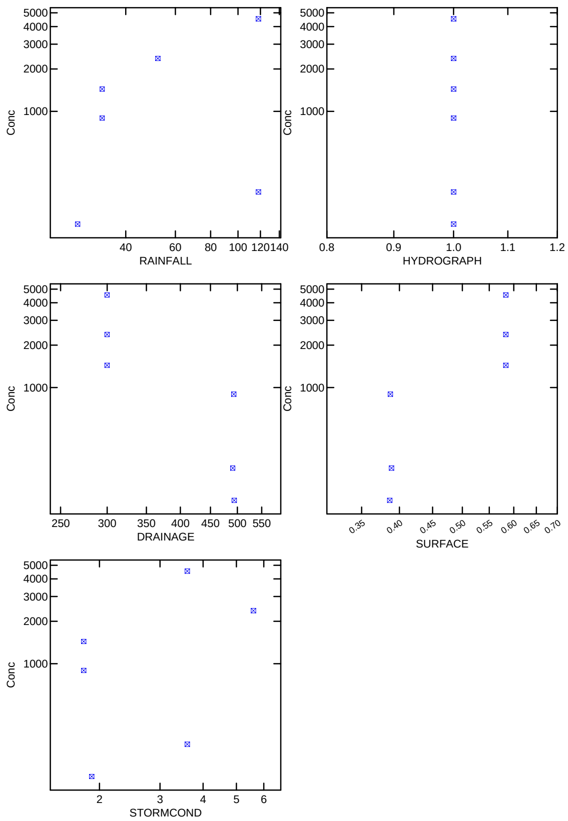


NORMAL SCALE

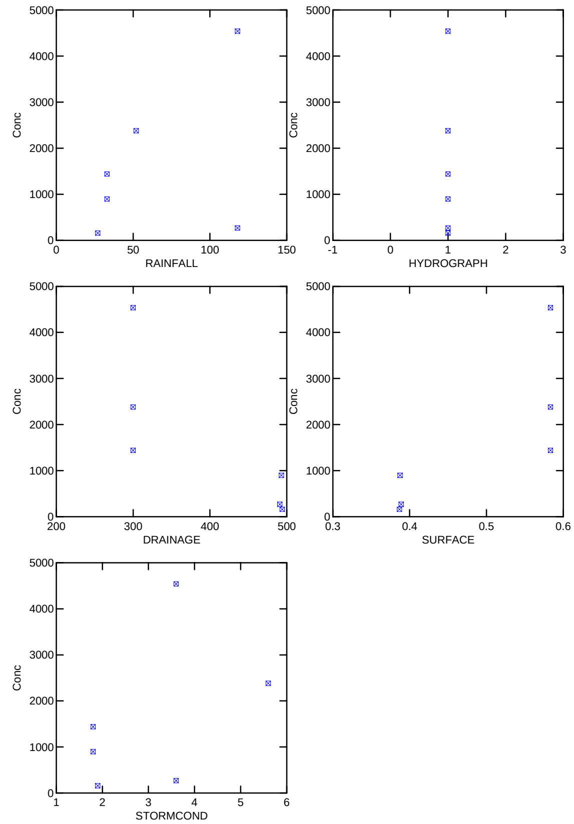


PCB-066, TOTAL

LOG-LOG SCALE

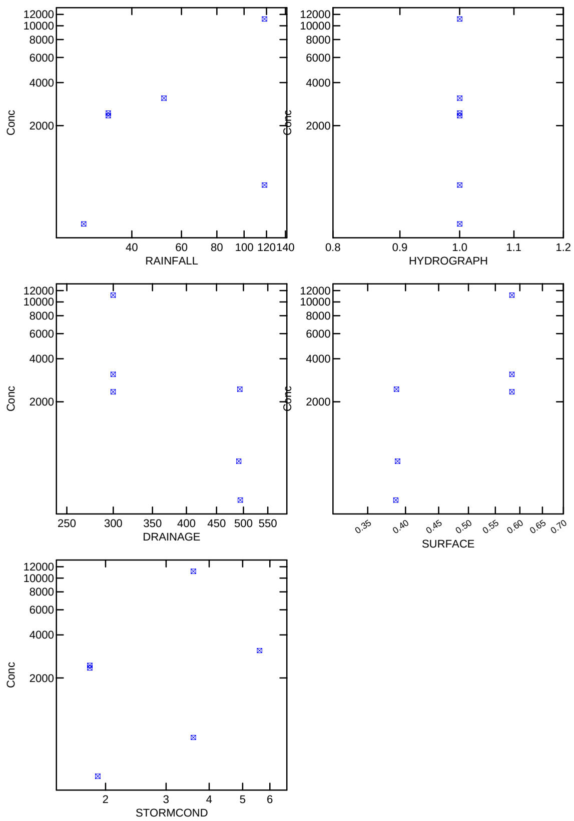


NORMAL SCALE

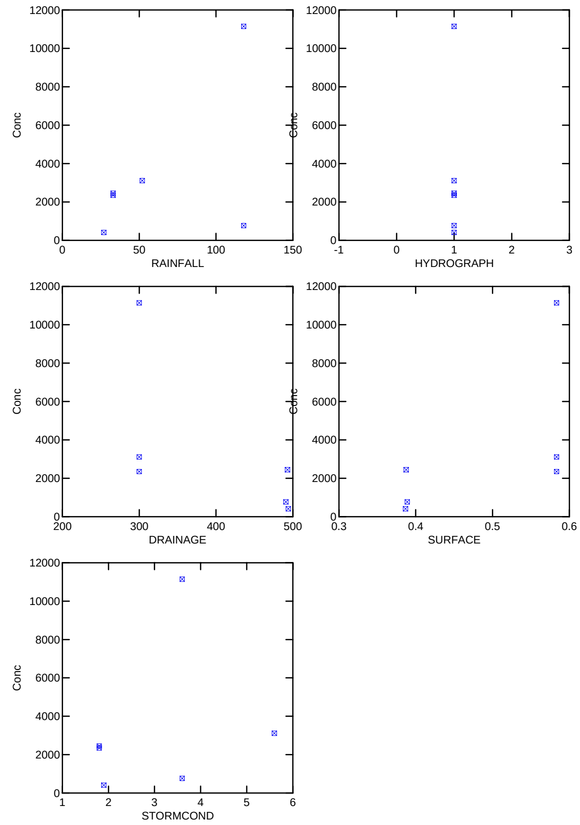


PCB-106, TOTAL

LOG-LOG SCALE

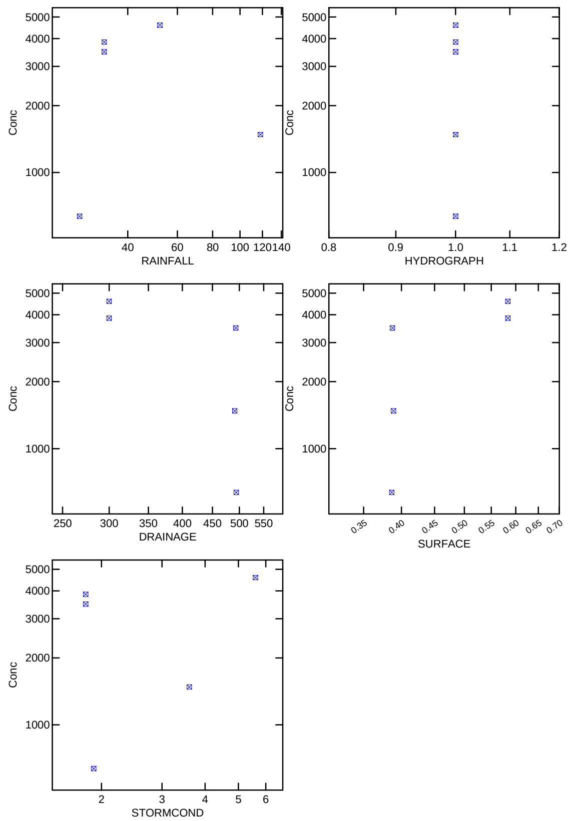


NORMAL SCALE

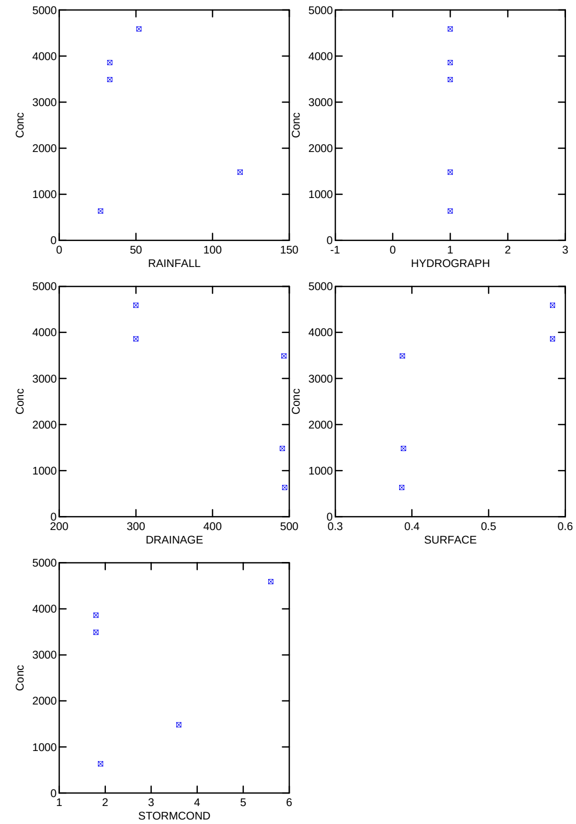


PCB-153, TOTAL

LOG-LOG SCALE

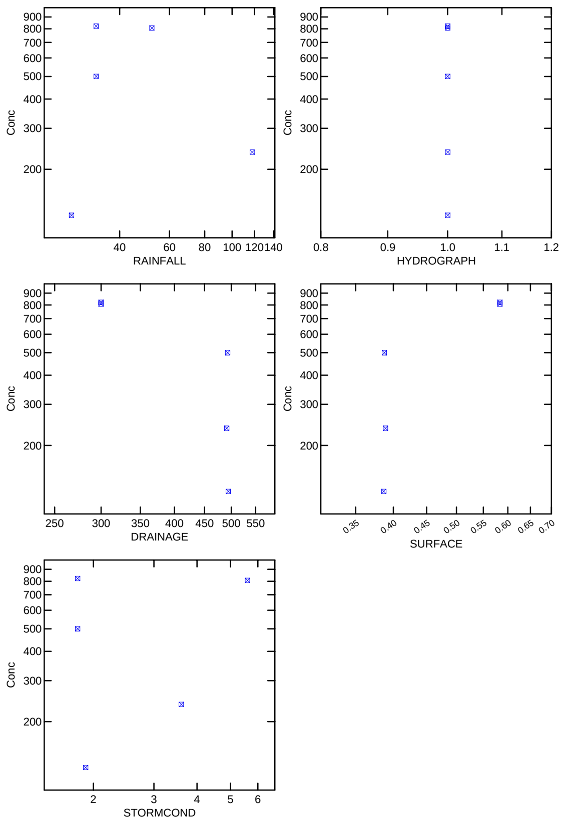


NORMAL SCALE

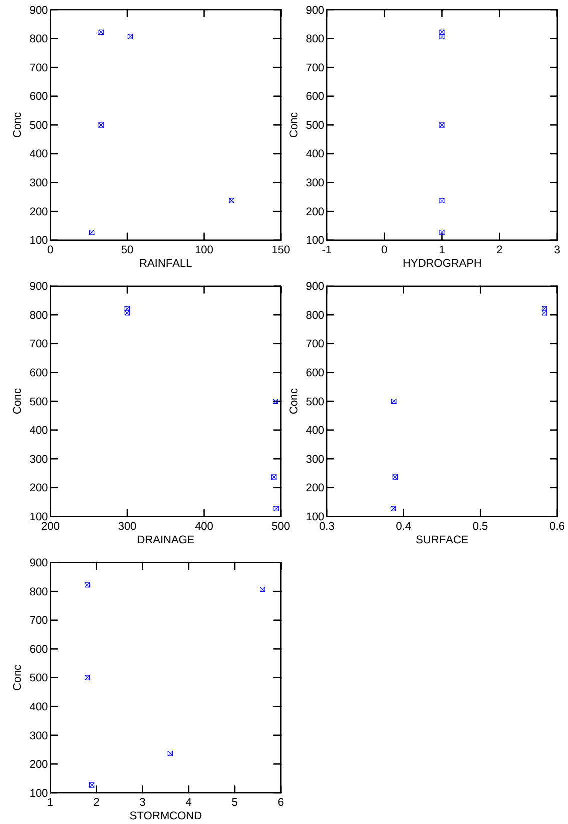


PCB-194, TOTAL

LOG-LOG SCALE

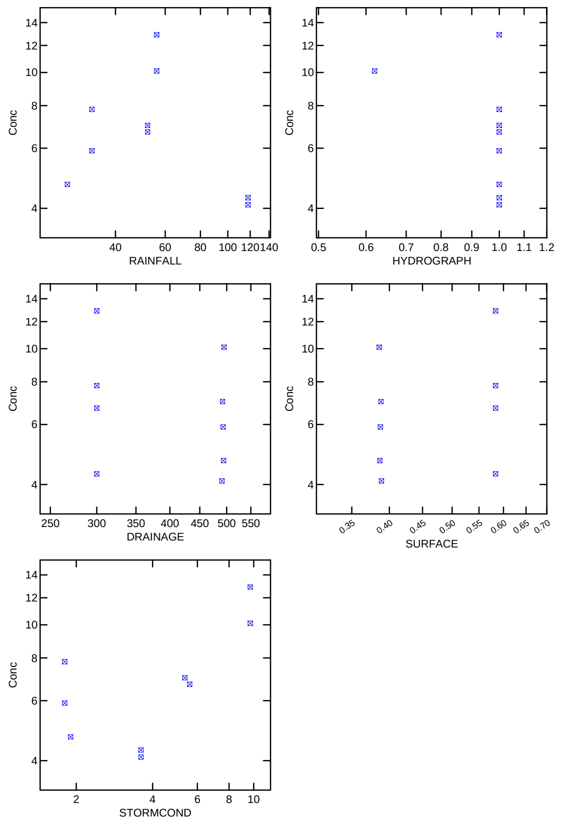


NORMAL SCALE

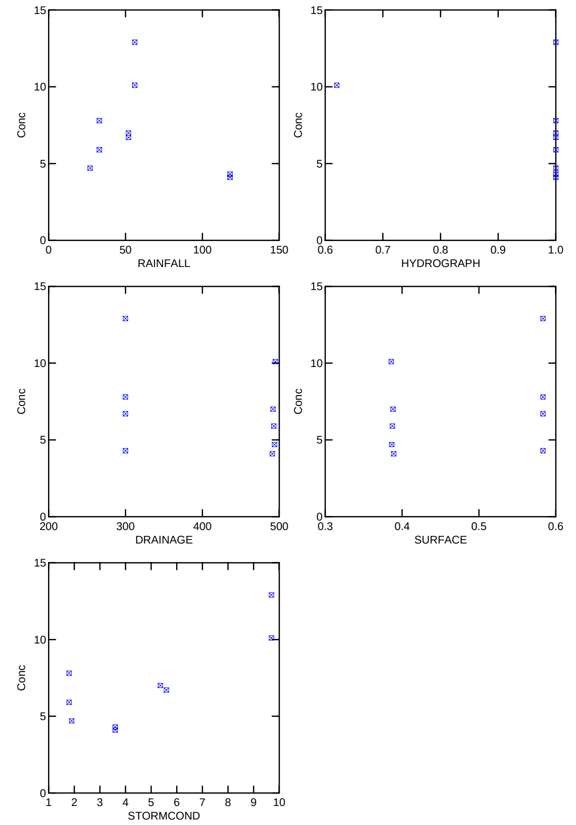


TOC

LOG-LOG SCALE

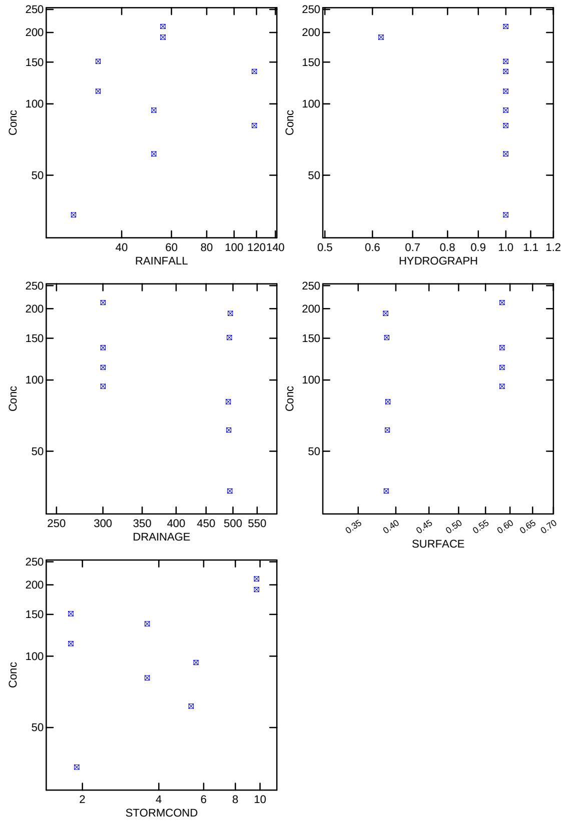


NORMAL SCALE

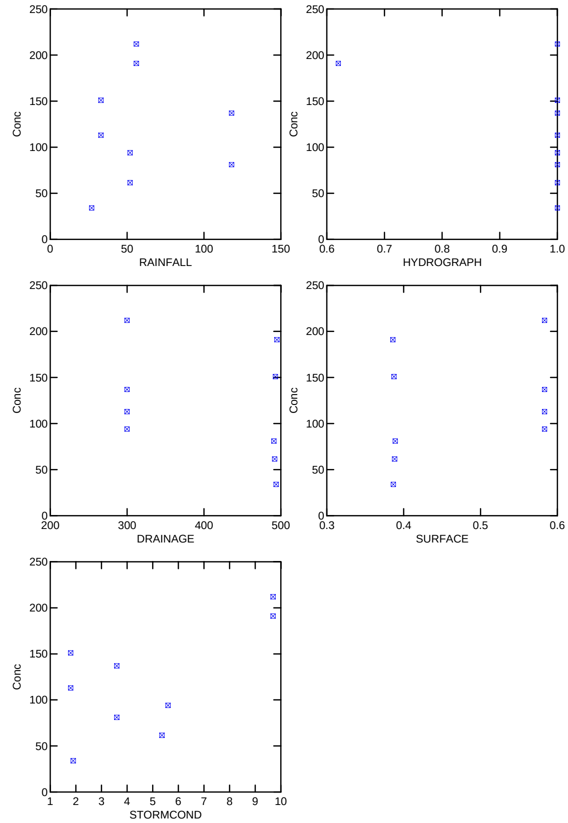


TSS

LOG-LOG SCALE



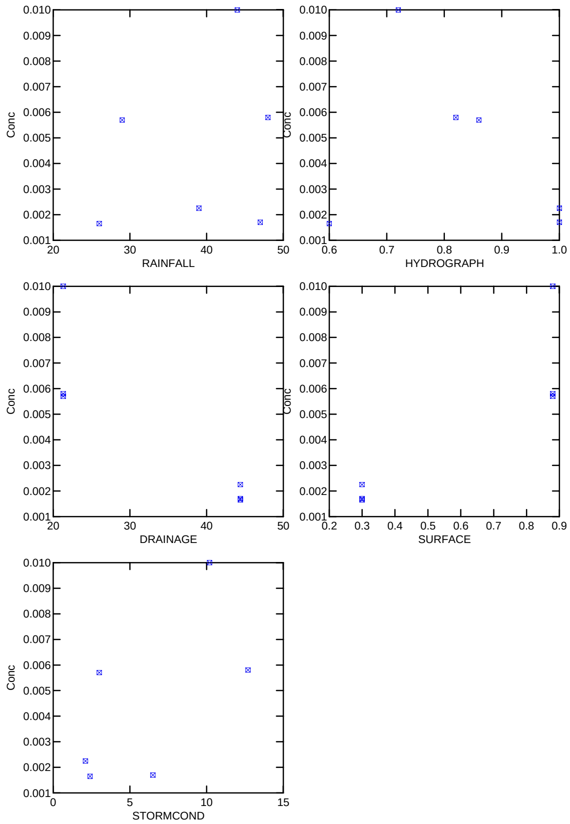
NORMAL SCALE



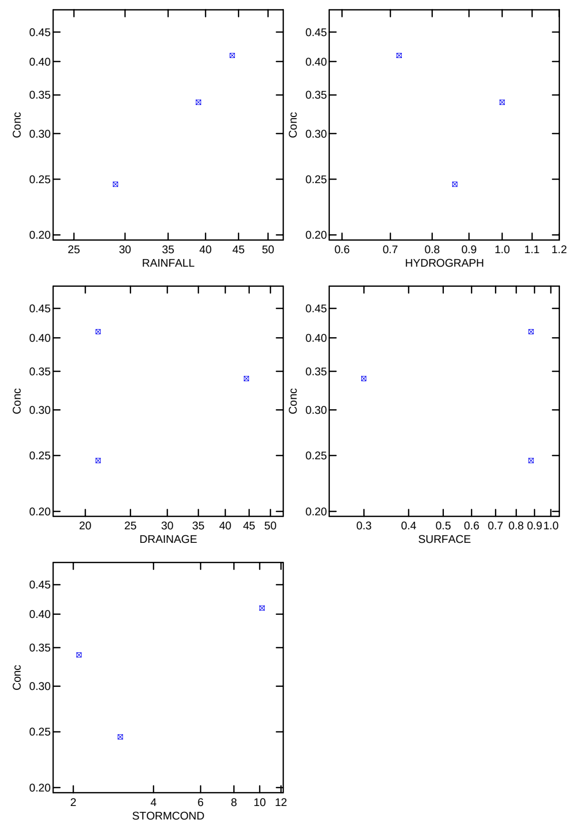
ORIGINAL REPRESENTATIVE RESIDENTIAL Q-Q AND BOX PLOTS

ARSENIC, DISSOLVED

NORMAL SCALE

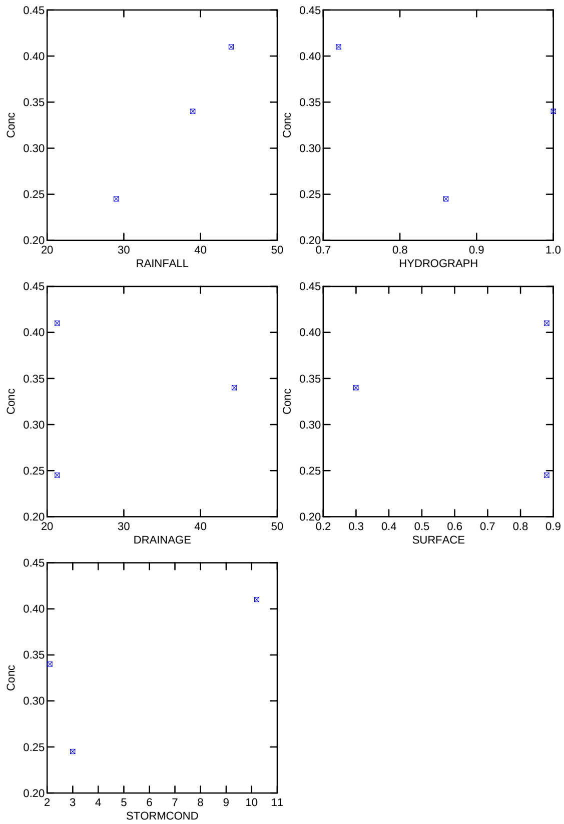


LOG-LOG SCALE

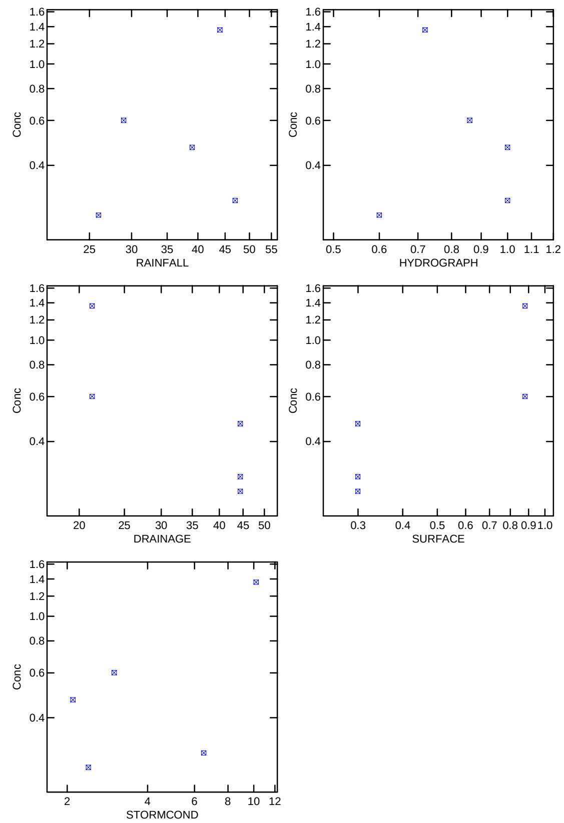


ARSENIC, TOTAL

NORMAL SCALE

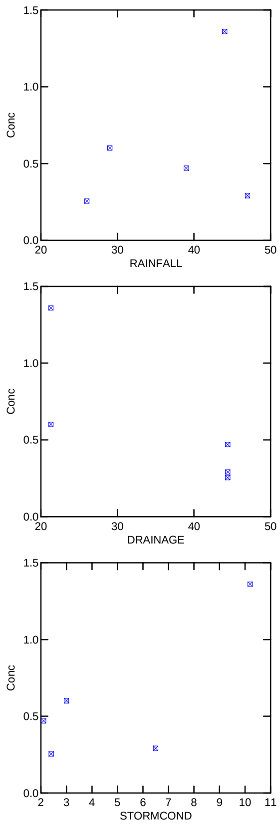


LOG-LOG SCALE

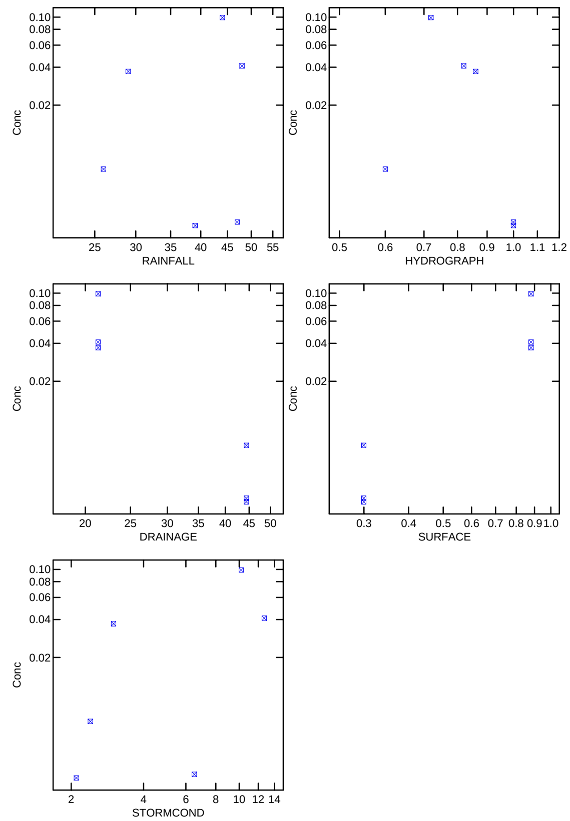


BENZO(A)PYRENE, TOTAL

NORMAL SCALE

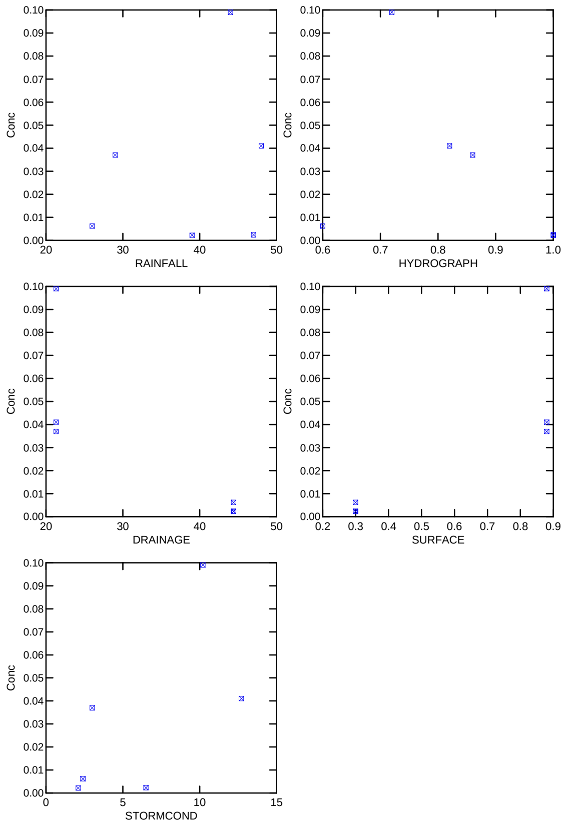


LOG-LOG SCALE

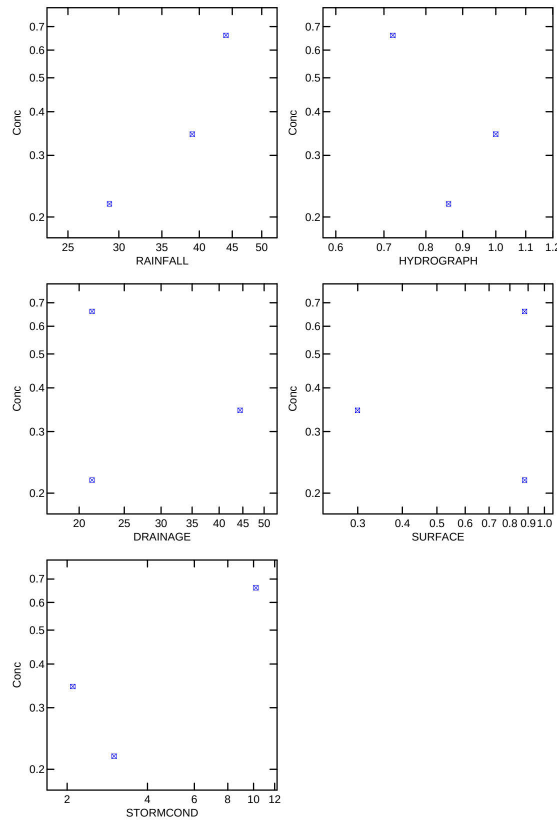


LEAD, DISSOLVED

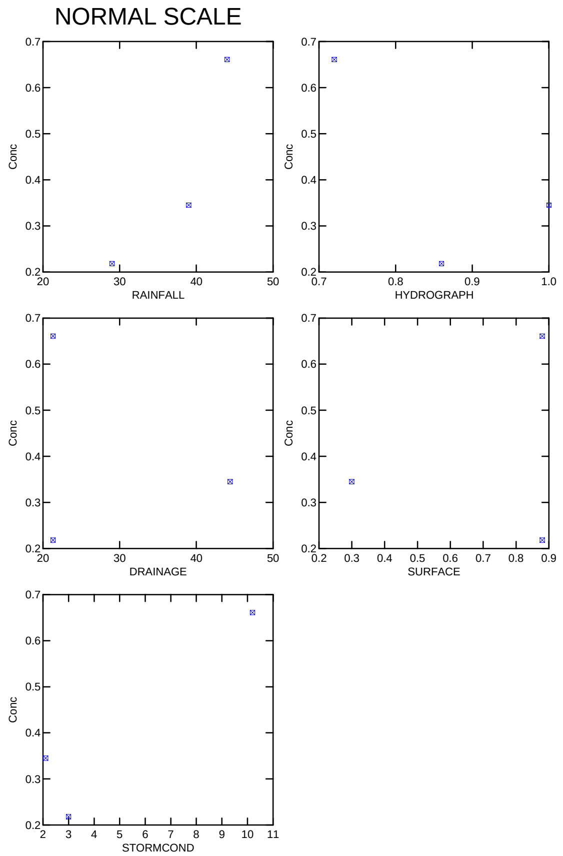
NORMAL SCALE

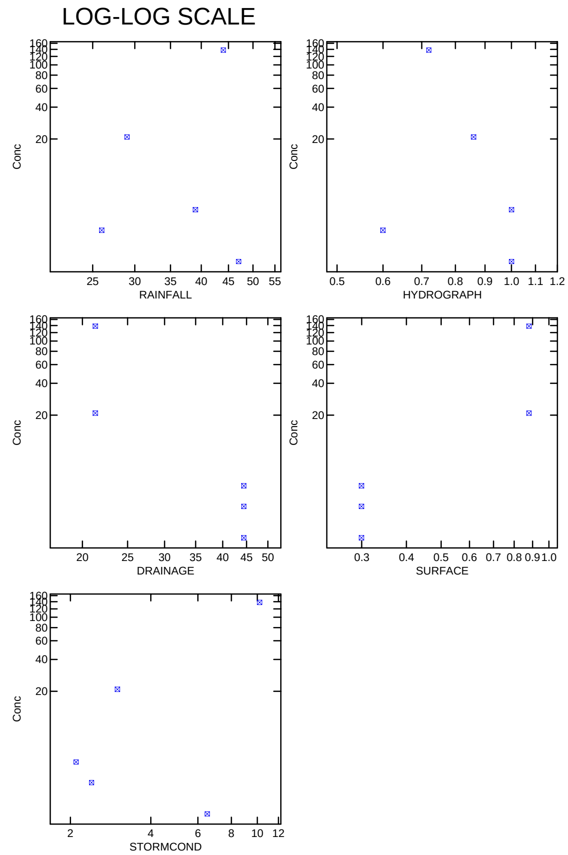


LOG-LOG SCALE



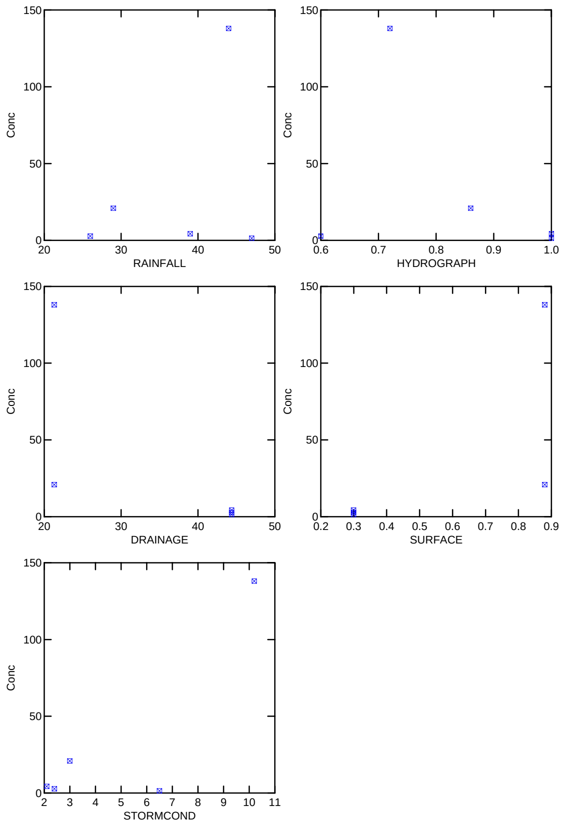
LEAD, TOTAL


NORMAL SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND

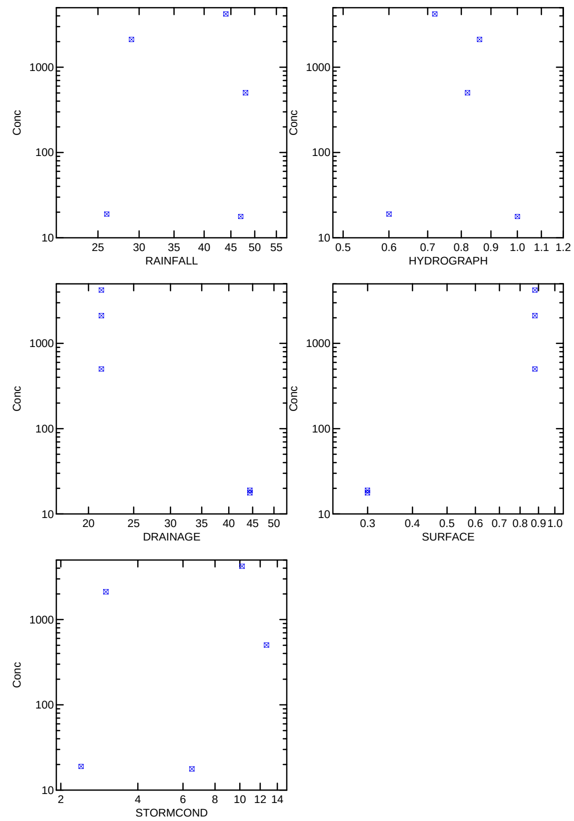

LOG-LOG SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND

PCB-018, TOTAL

NORMAL SCALE

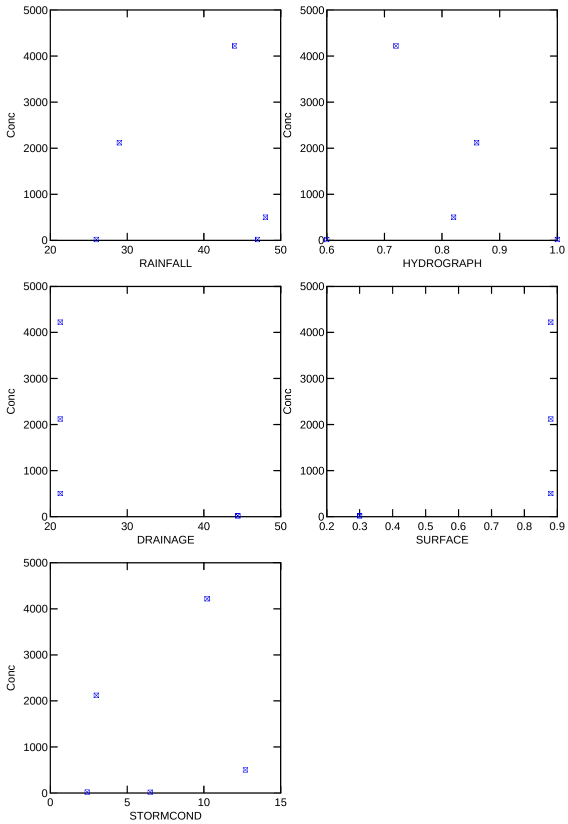


LOG-LOG SCALE

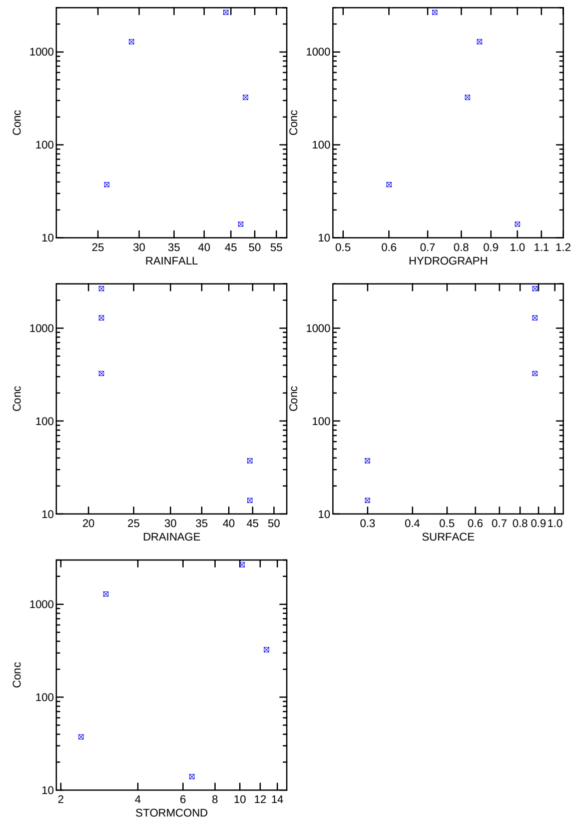


PCB-066, TOTAL

NORMAL SCALE

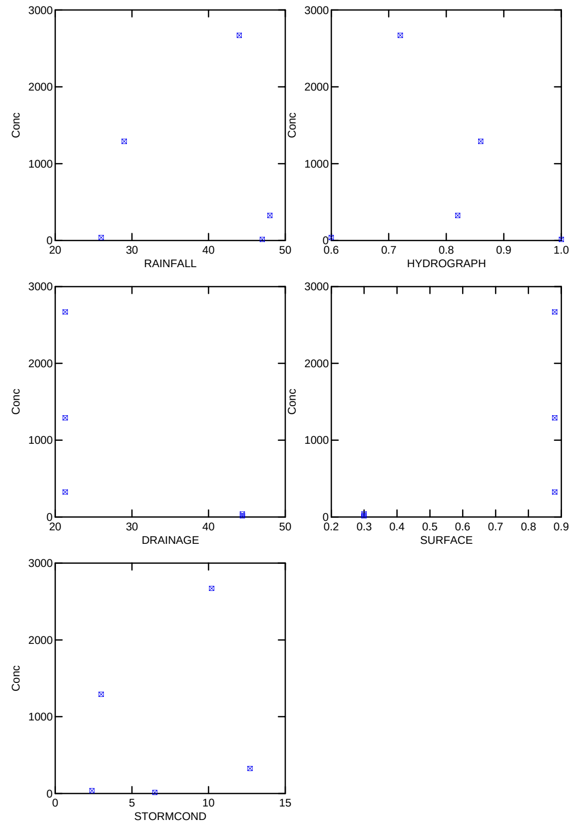


LOG-LOG SCALE

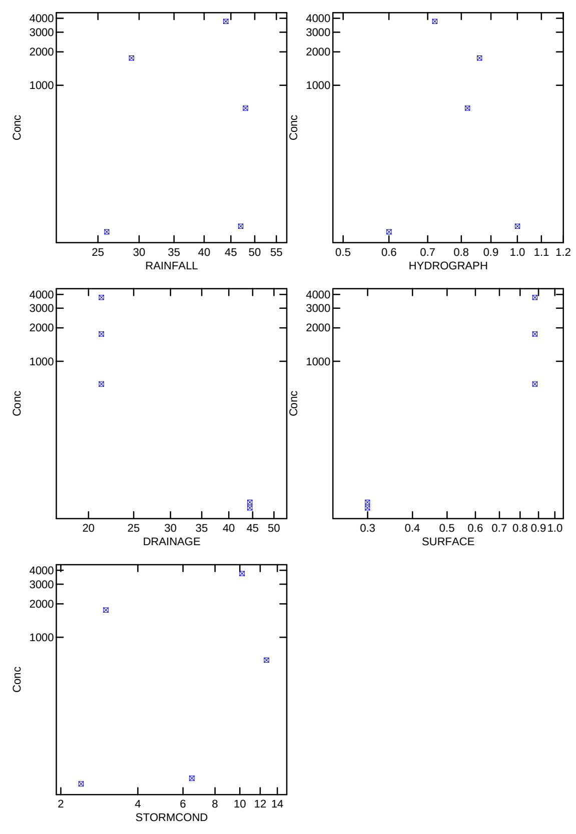


PCB-106, TOTAL

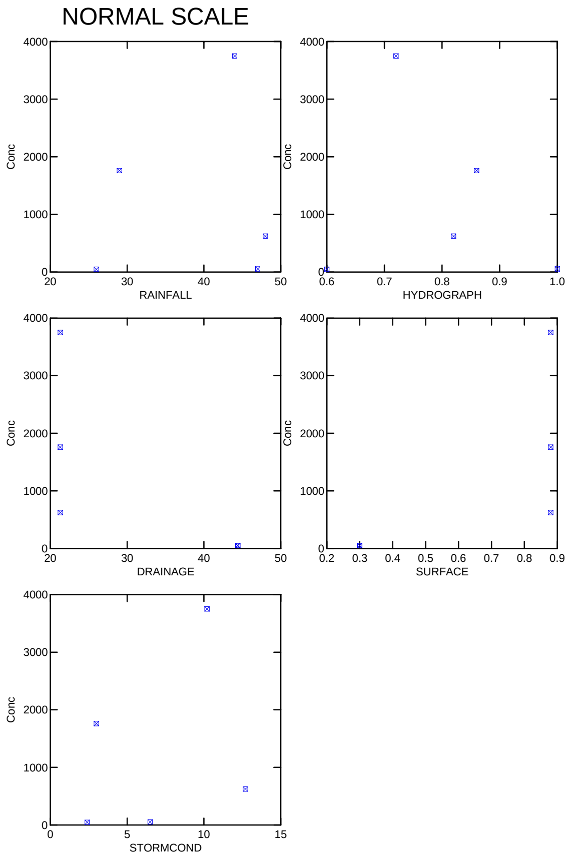
NORMAL SCALE

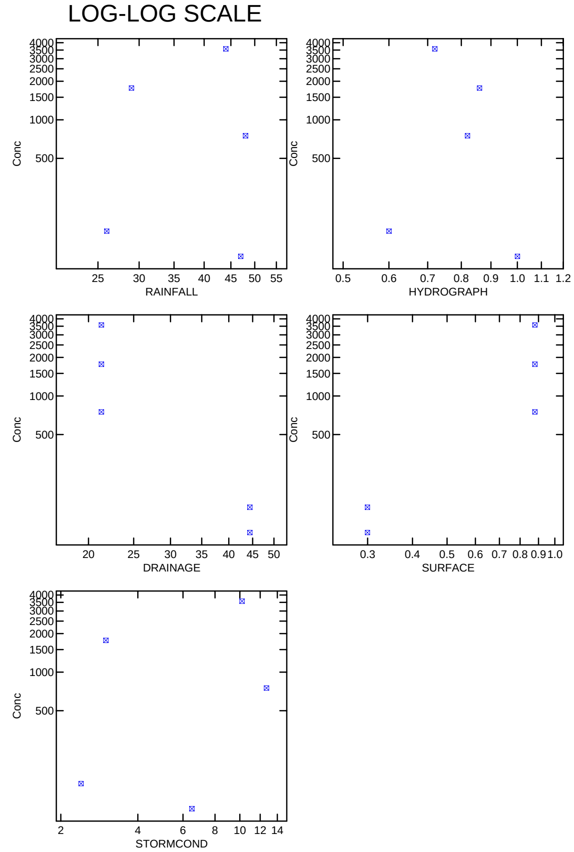


LOG-LOG SCALE



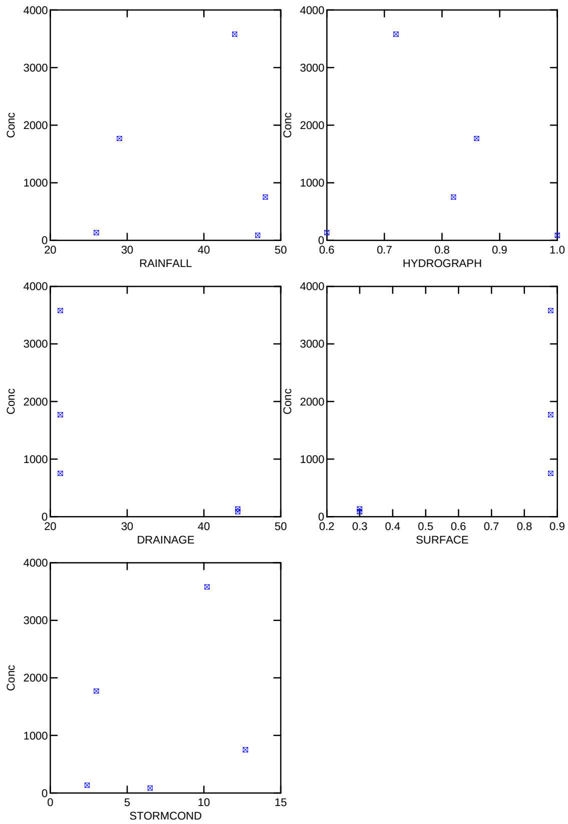
PCB-153, TOTAL



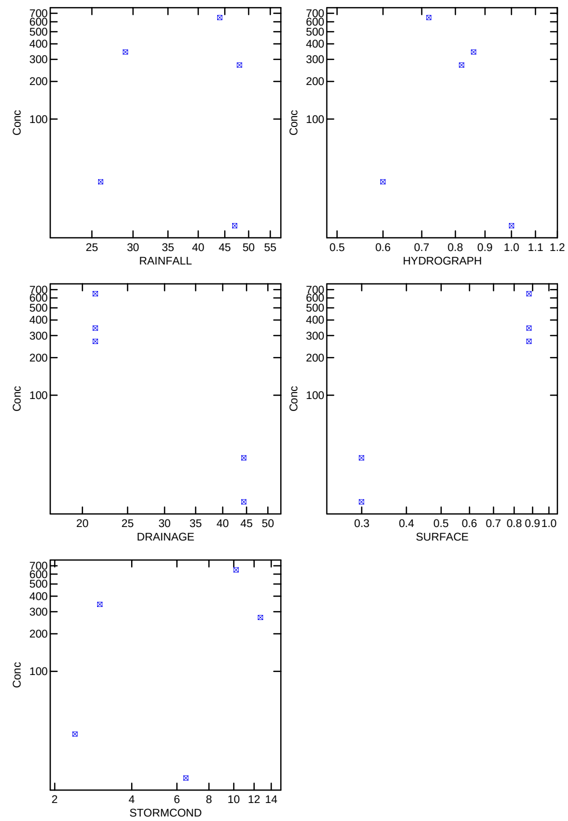


PCB-194, TOTAL

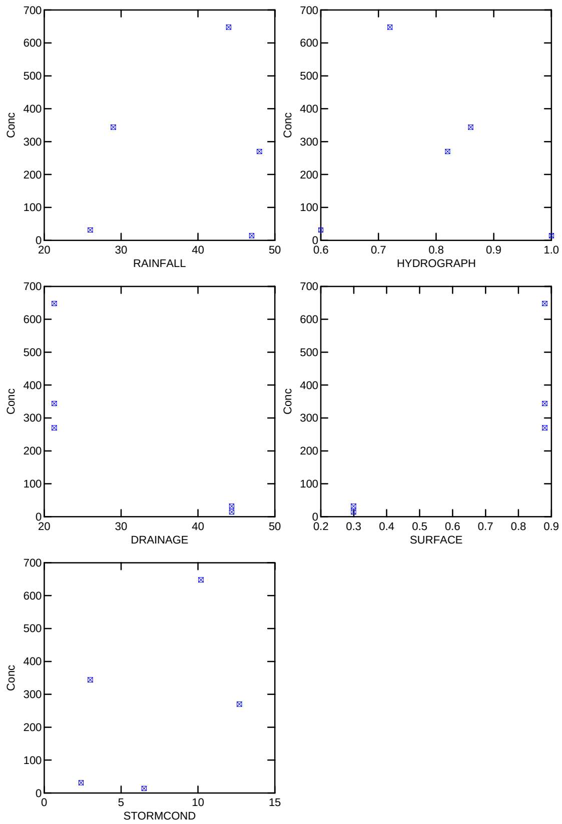
NORMAL SCALE



LOG-LOG SCALE

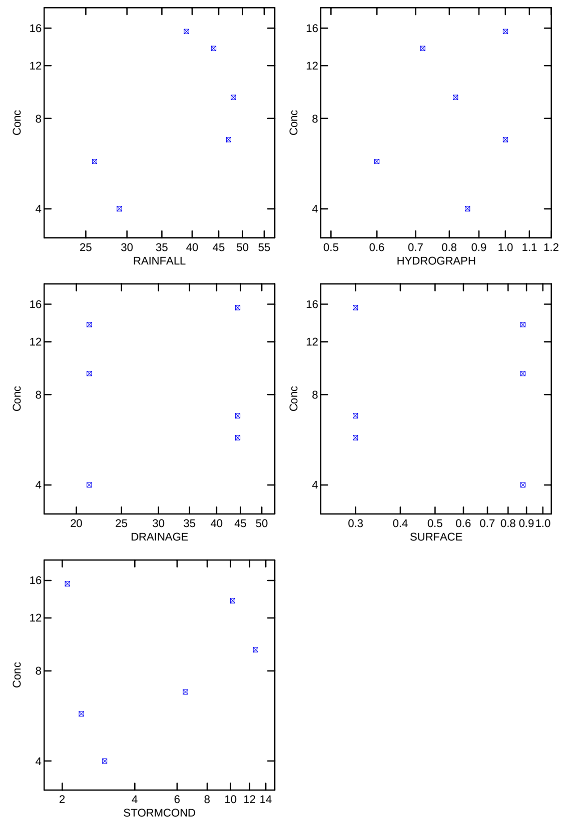


NORMAL SCALE



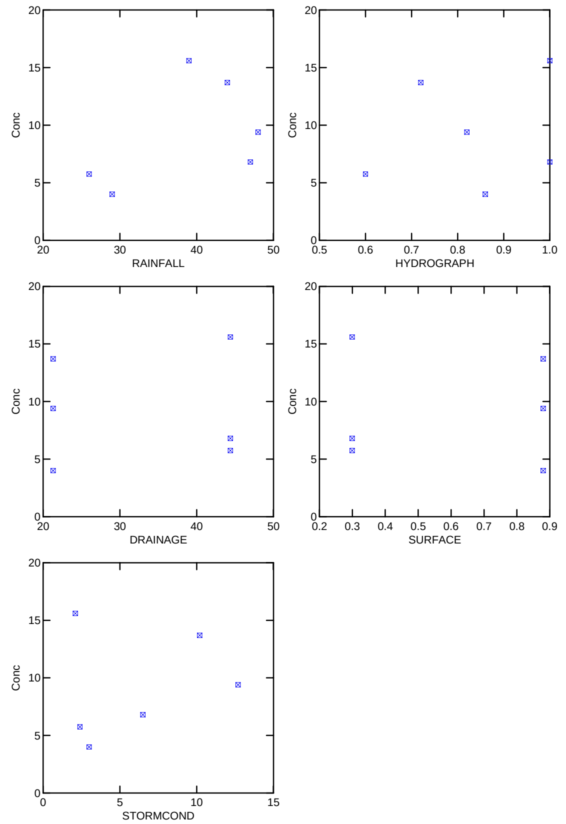
TOC

LOG-LOG SCALE

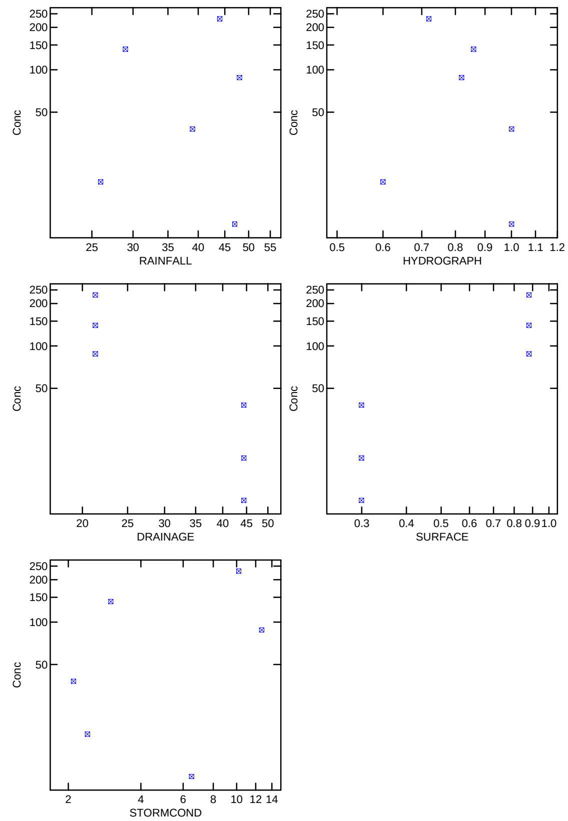


TSS

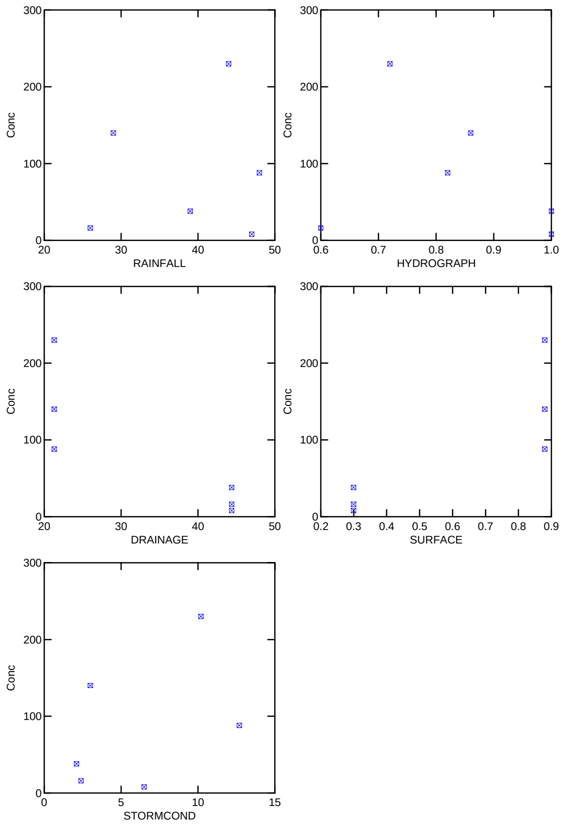
NORMAL SCALE



LOG-LOG SCALE



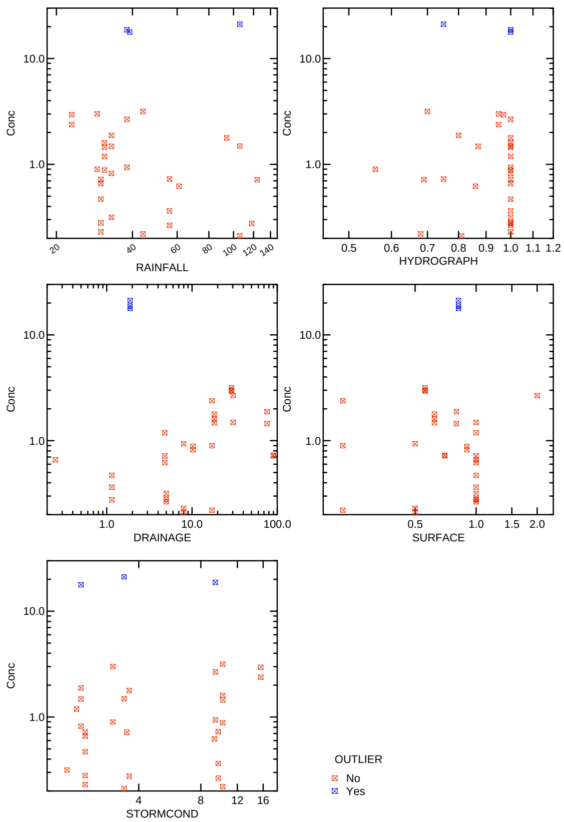
NORMAL SCALE



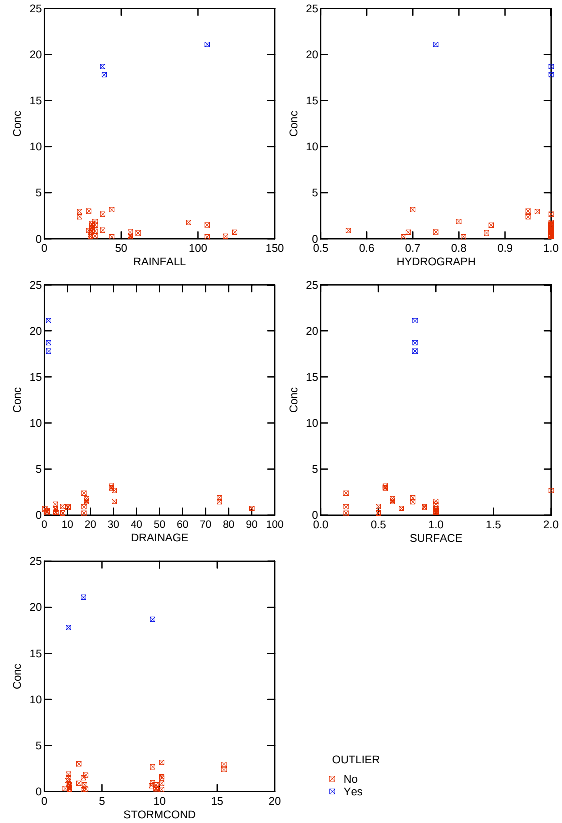
RECLASSIFIED UNIQUE HEAVY INDUSTRIAL Q-Q AND BOX PLOTS

ARSENIC, DISSOLVED

LOG-LOG SCALE

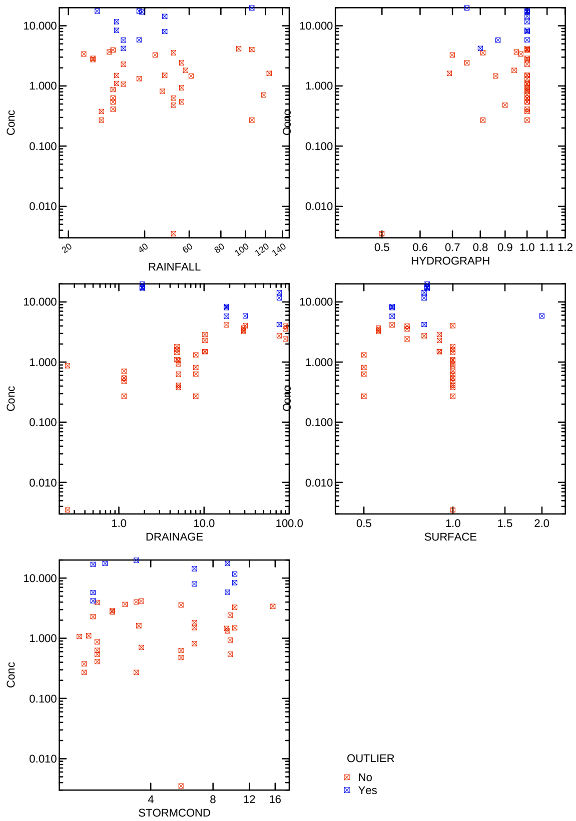


NORMAL SCALE

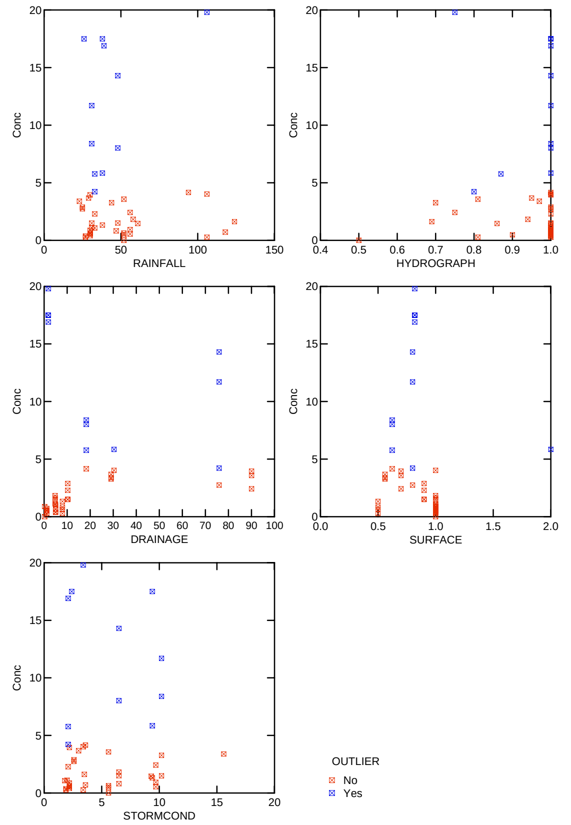


ARSENIC, TOTAL

LOG-LOG SCALE

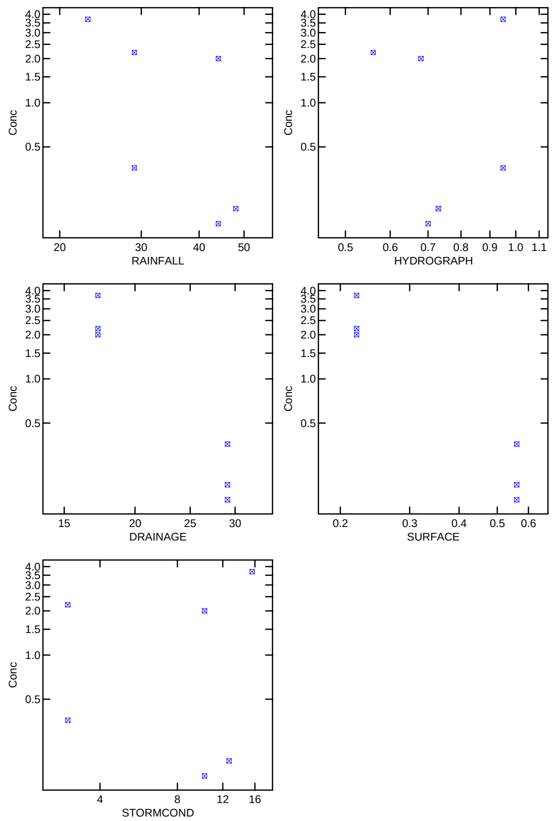


NORMAL SCALE

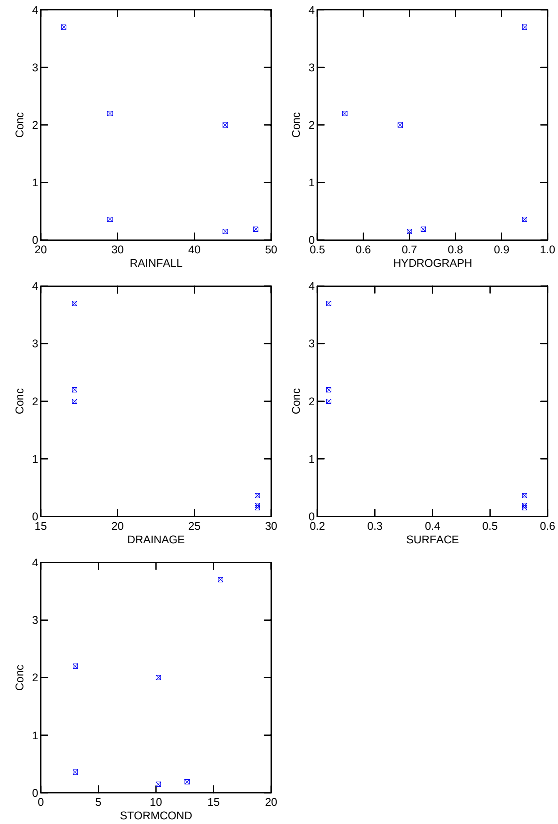


BENZO(A)PYRENE, TOTAL

LOG-LOG SCALE

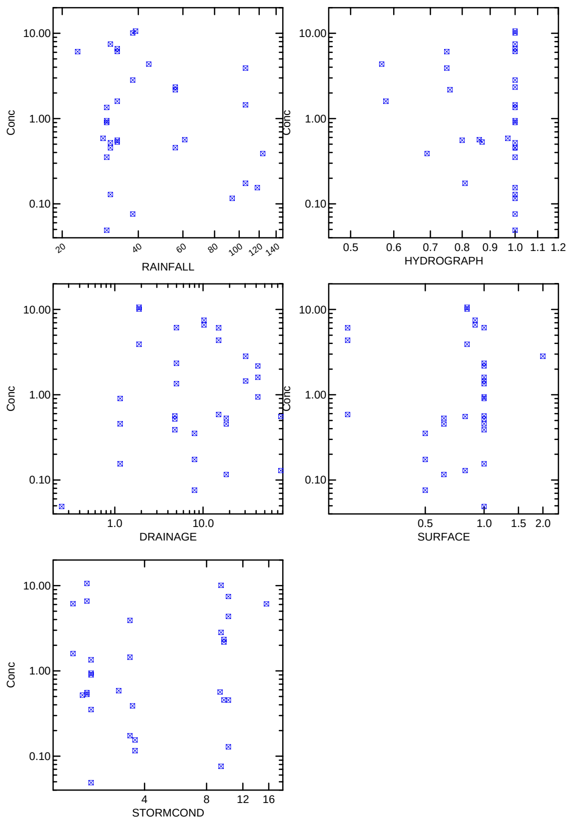


NORMAL SCALE

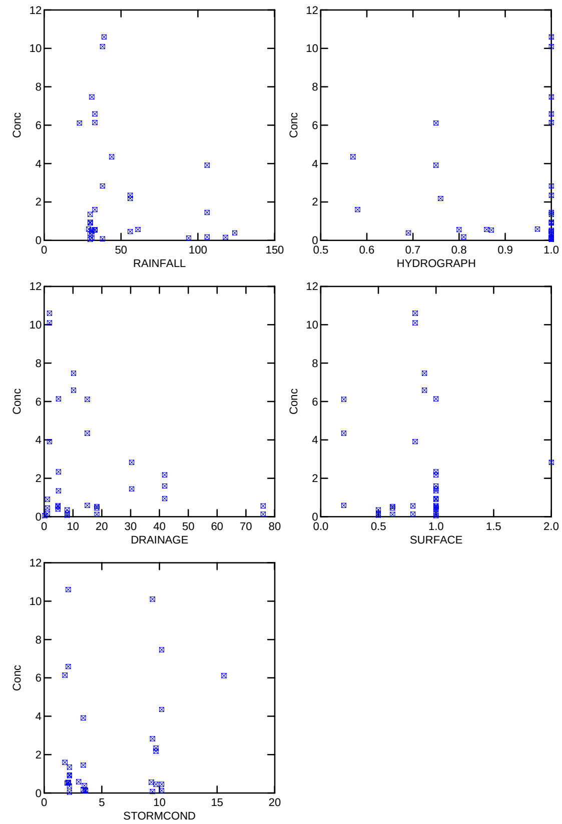


LEAD, DISSOLVED

LOG-LOG SCALE

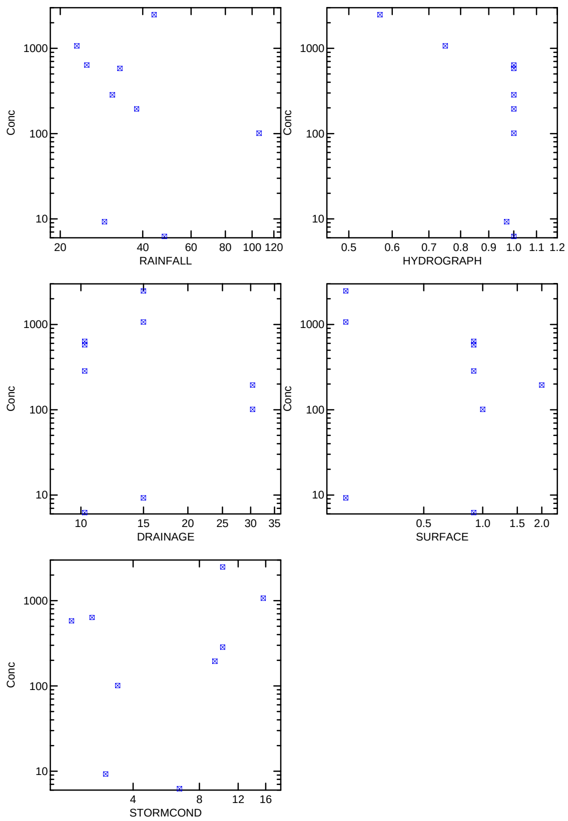


NORMAL SCALE

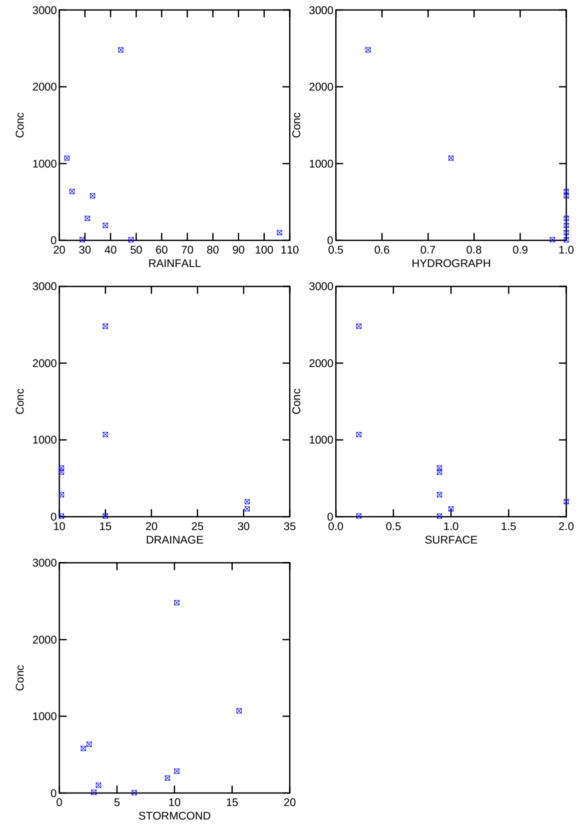


LEAD, TOTAL

LOG-LOG SCALE

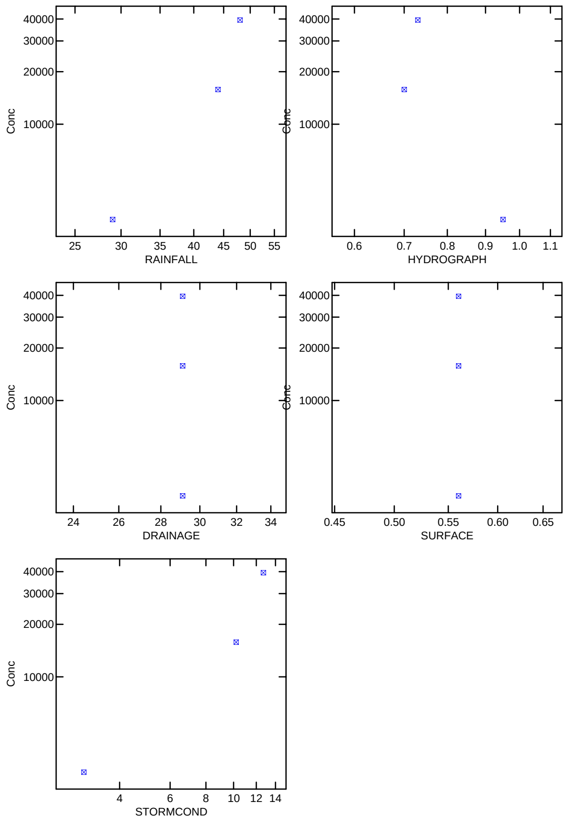


NORMAL SCALE

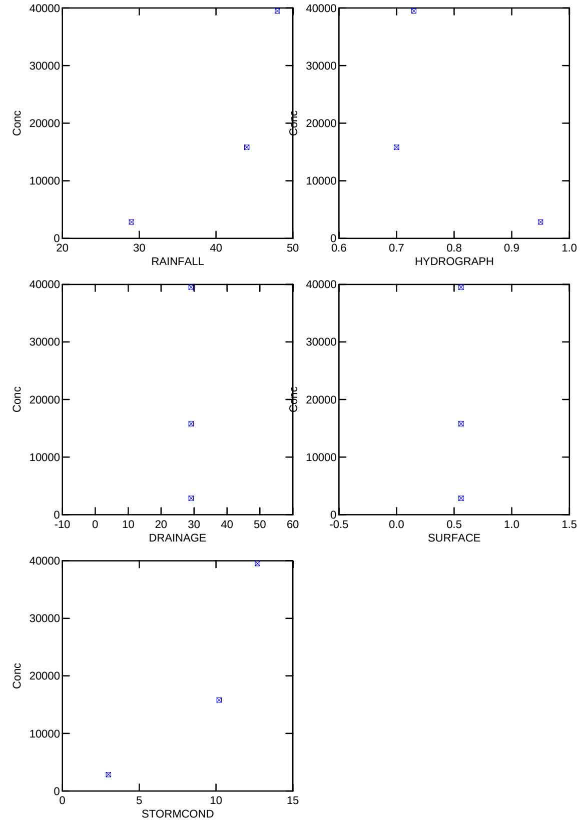


PCB-106, TOTAL

LOG-LOG SCALE

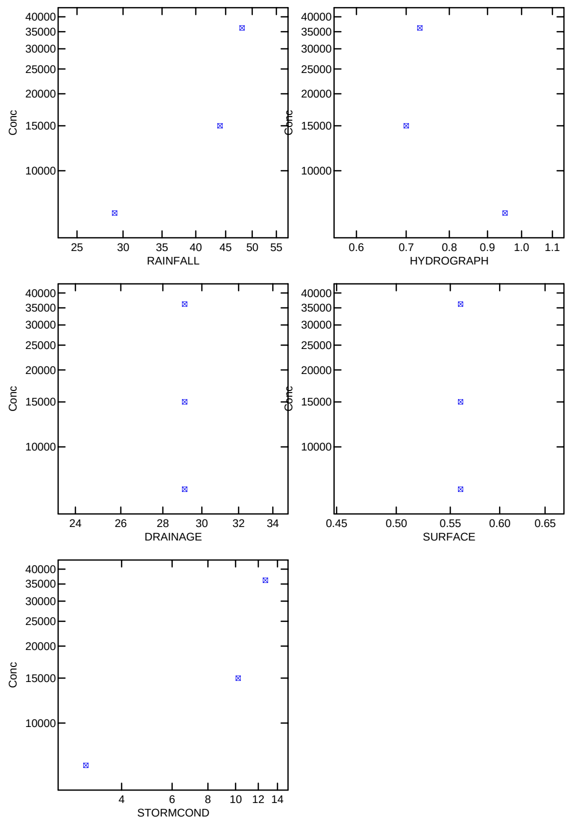


NORMAL SCALE

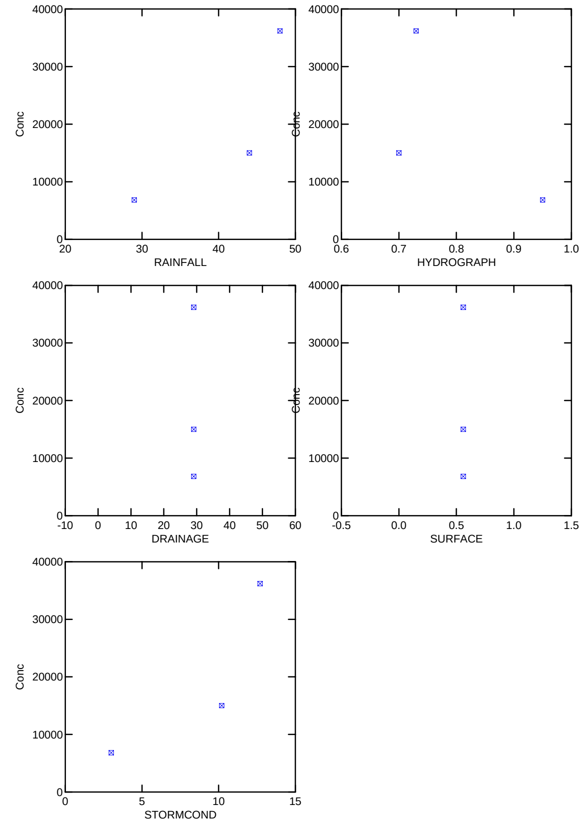


PCB-153, TOTAL

LOG-LOG SCALE

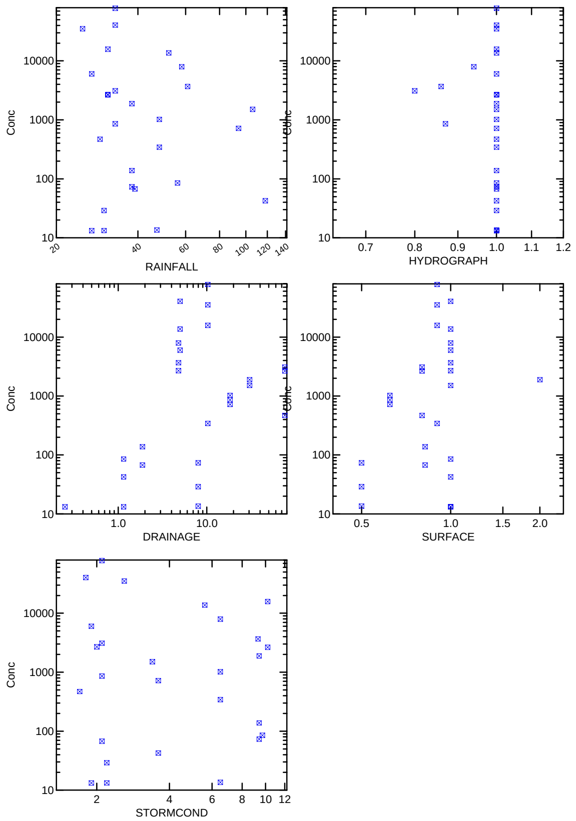


NORMAL SCALE

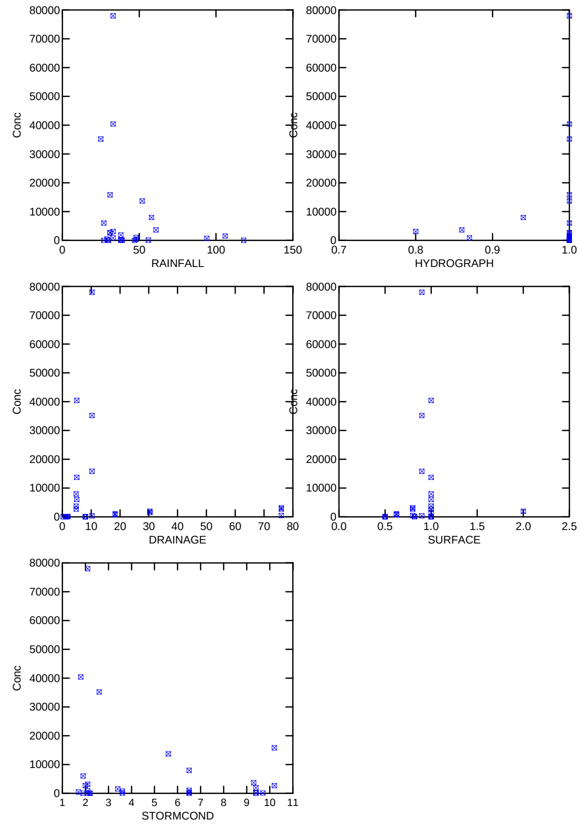


PCB-194, TOTAL

LOG-LOG SCALE

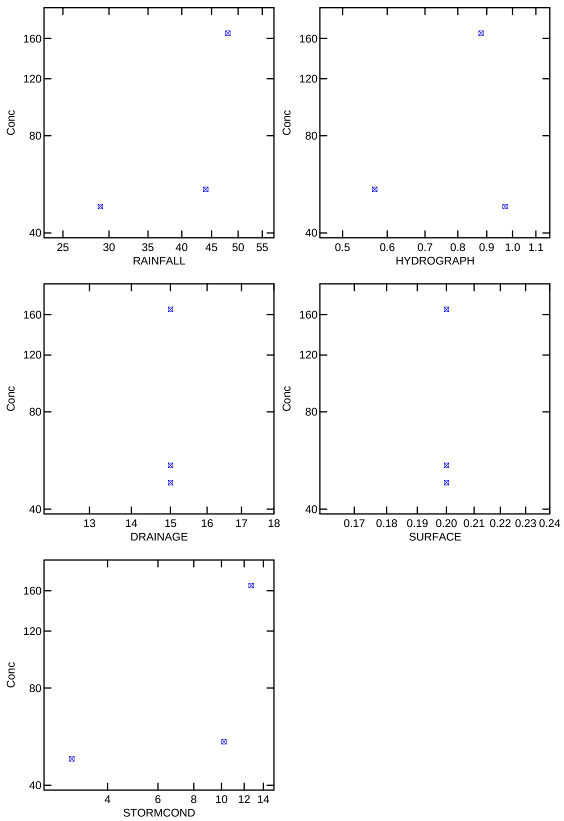


NORMAL SCALE

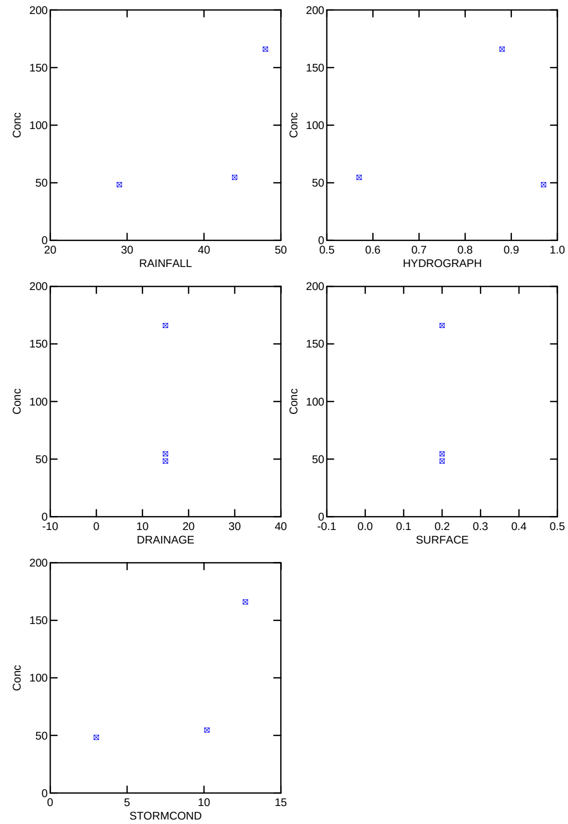


TOC

LOG-LOG SCALE



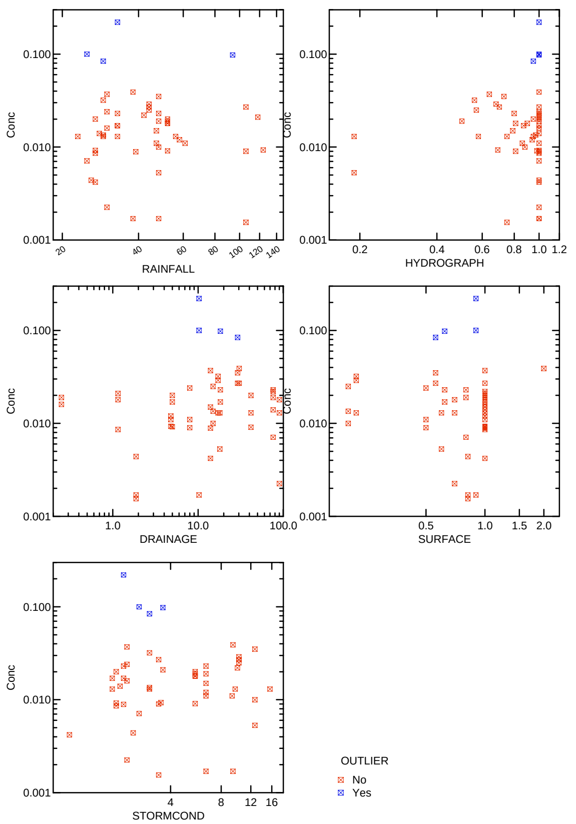
NORMAL SCALE



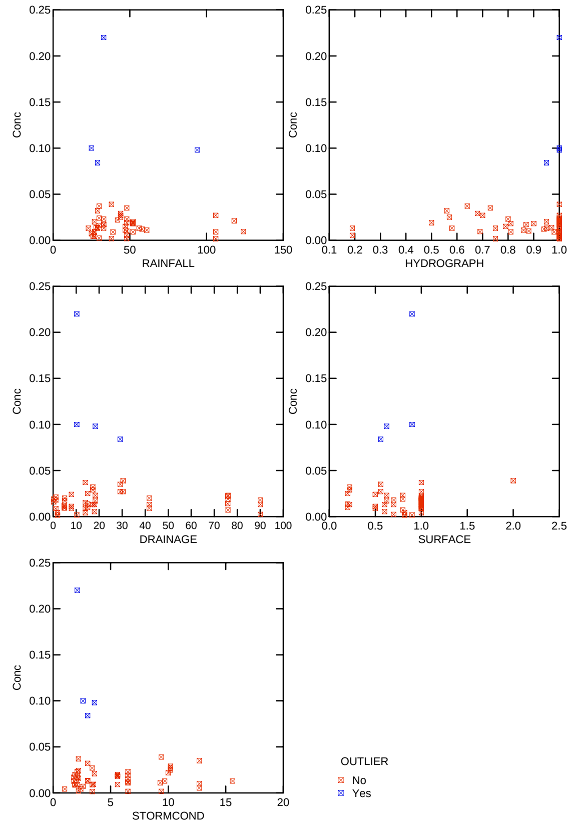
RECLASSIFIED REPRESENTATIVE HEAVY INDUSTRIAL Q-Q AND BOX PLOTS

ACENAPHTHYLENE, TOTAL

LOG-LOG SCALE

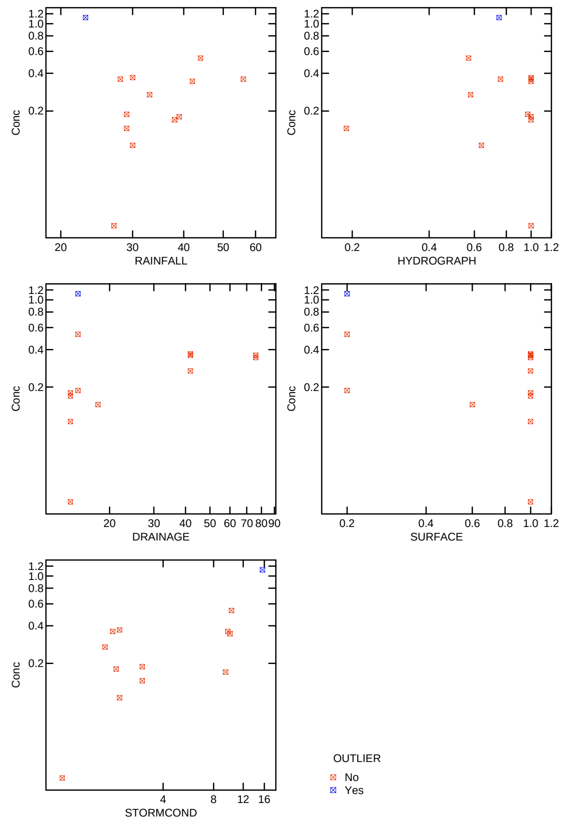


NORMAL SCALE

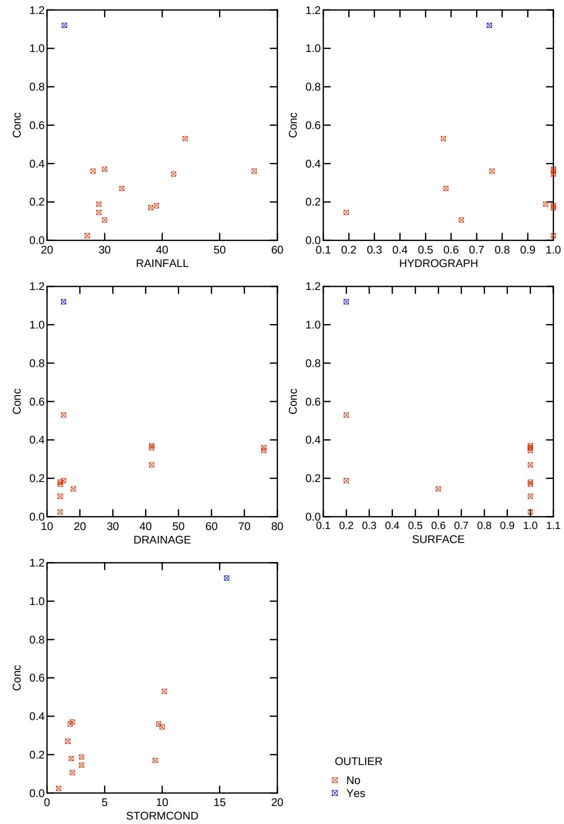


ARSENIC, DISSOLVED

LOG-LOG SCALE

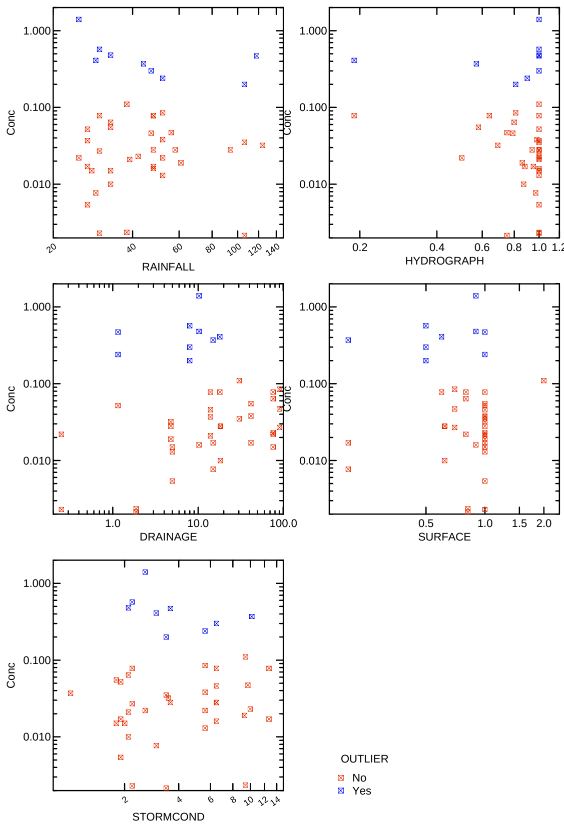


NORMAL SCALE

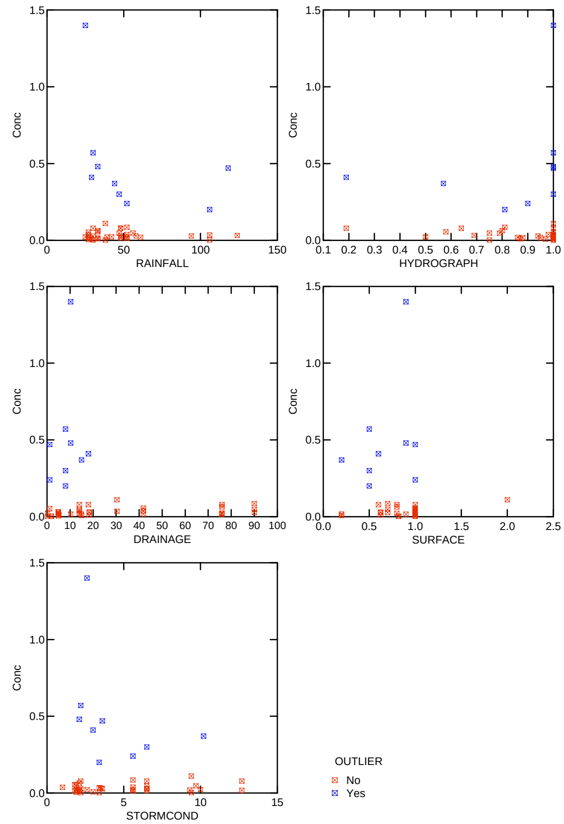


BENZO(A)PYRENE, TOTAL

LOG-LOG SCALE

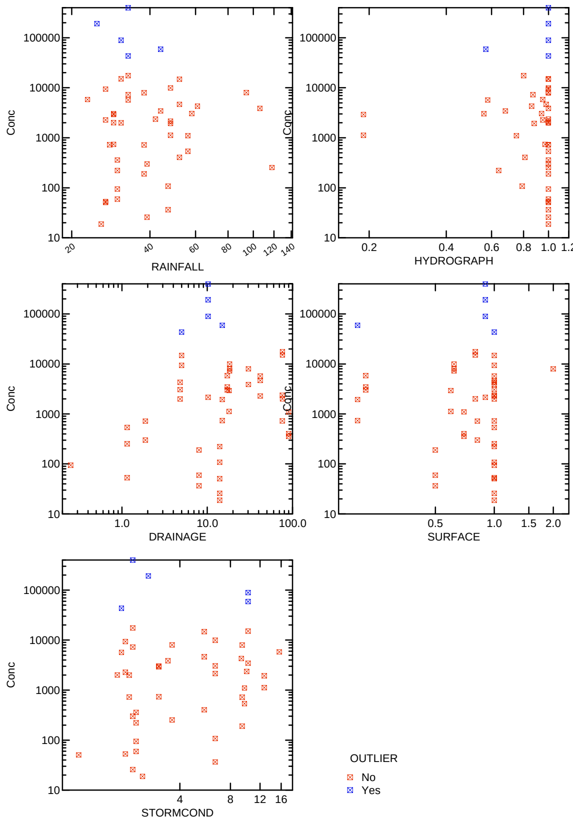


NORMAL SCALE

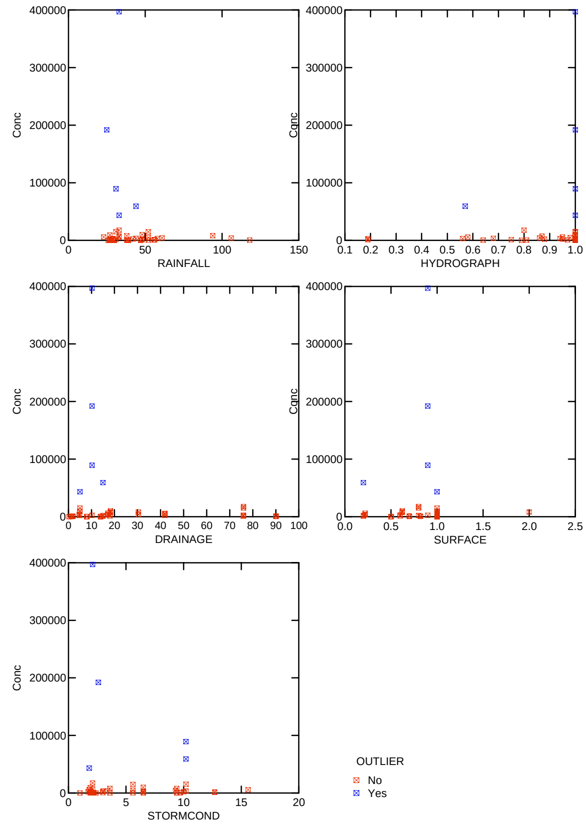


PCB-106, TOTAL

LOG-LOG SCALE

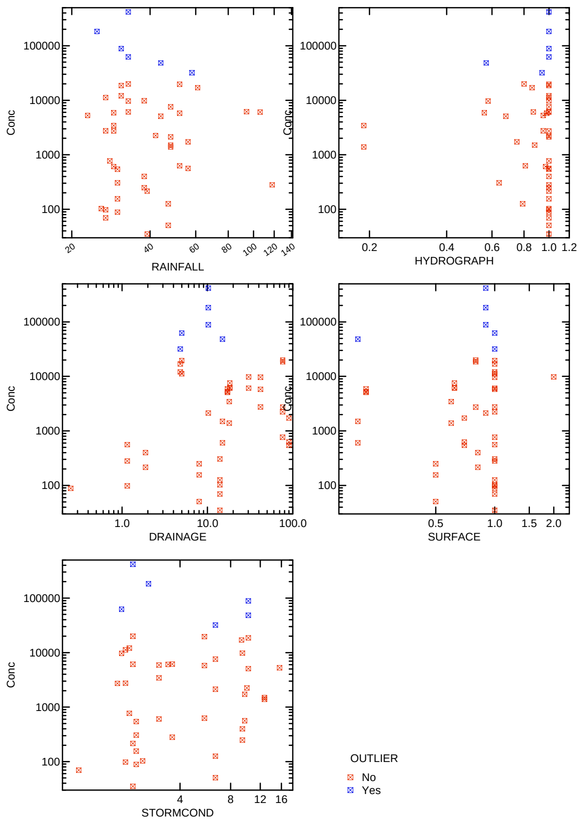


NORMAL SCALE

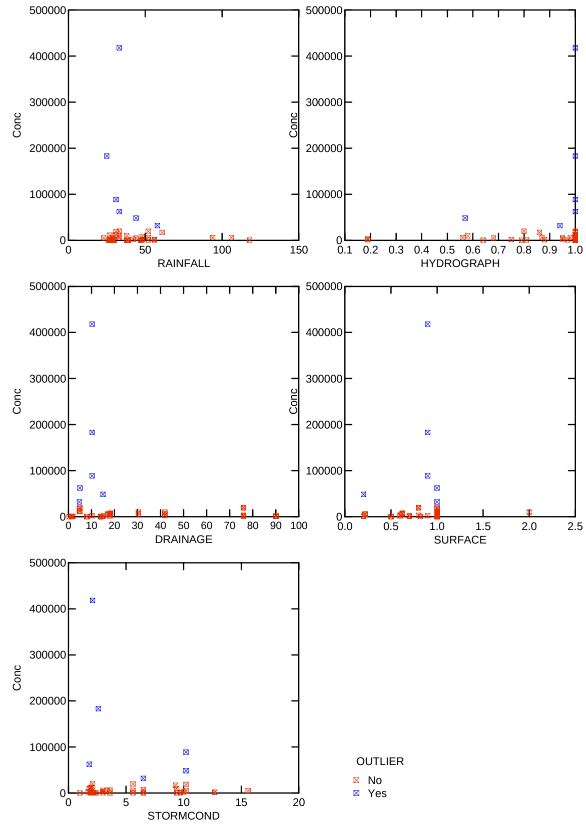


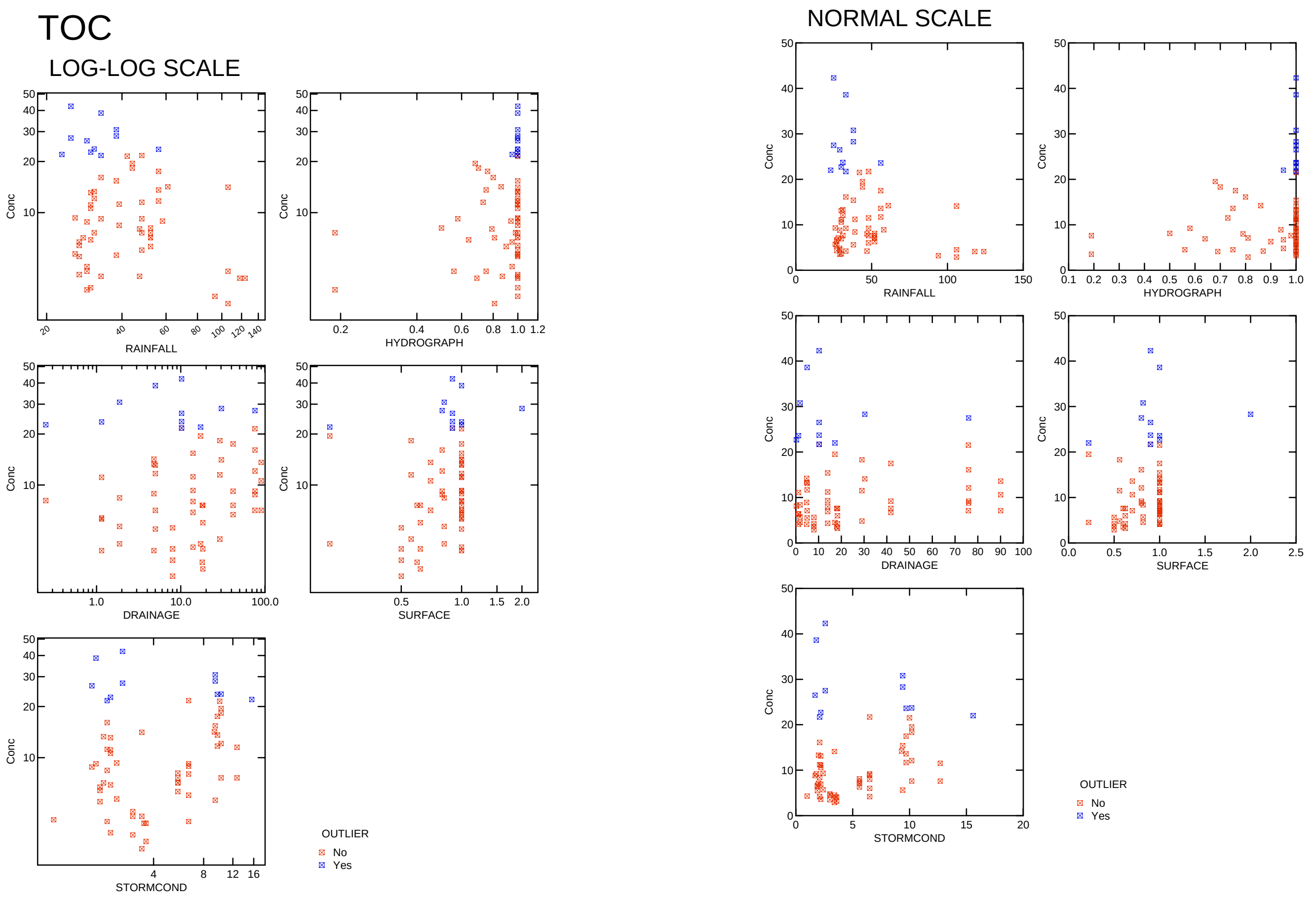
PCB-153, TOTAL

LOG-LOG SCALE



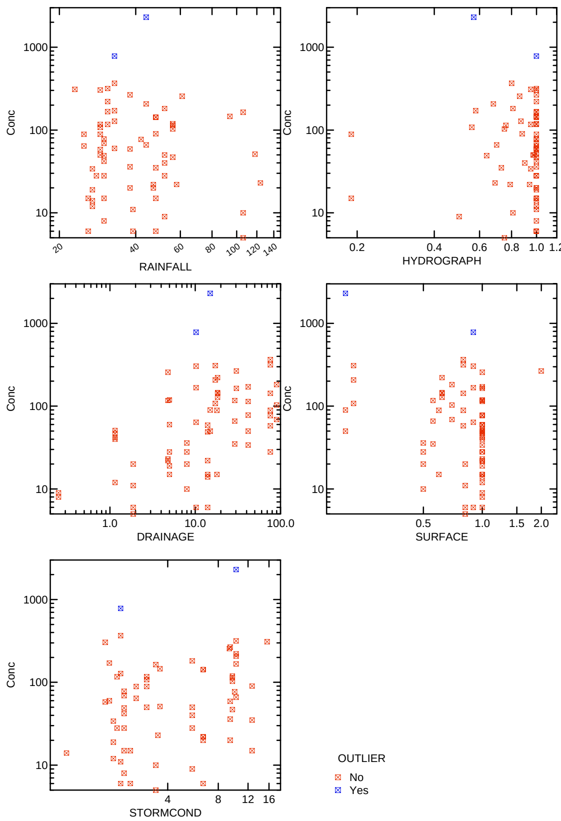
NORMAL SCALE



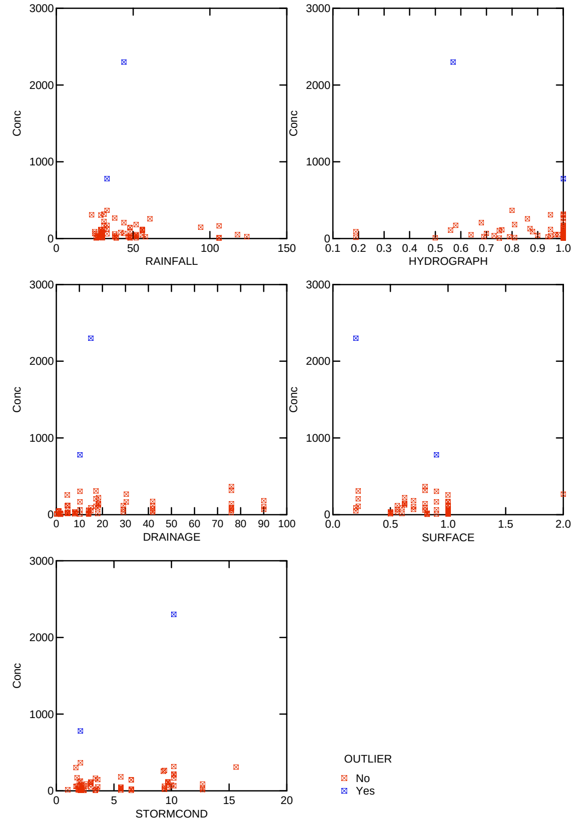

TOC
LOG-LOG SCALE
NORMAL SCALE
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND
OUTLIER
No
Yes

TSS

LOG-LOG SCALE

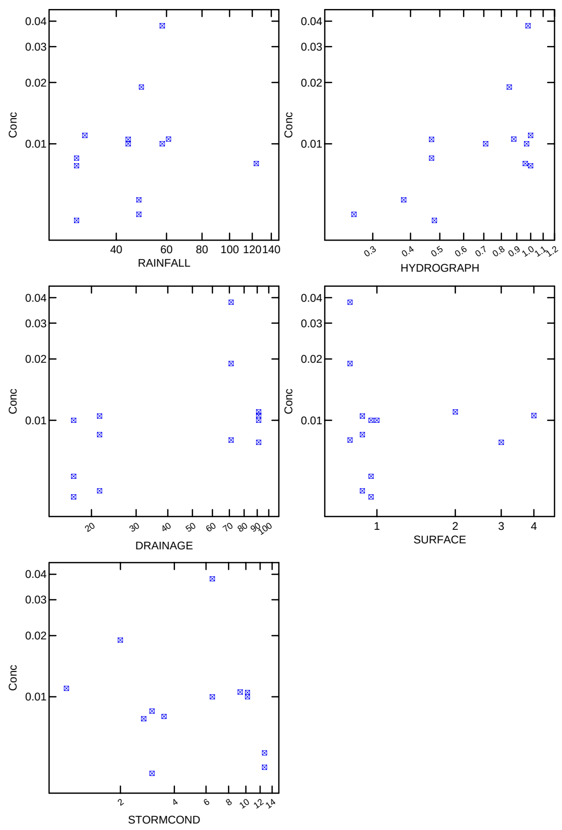


NORMAL SCALE

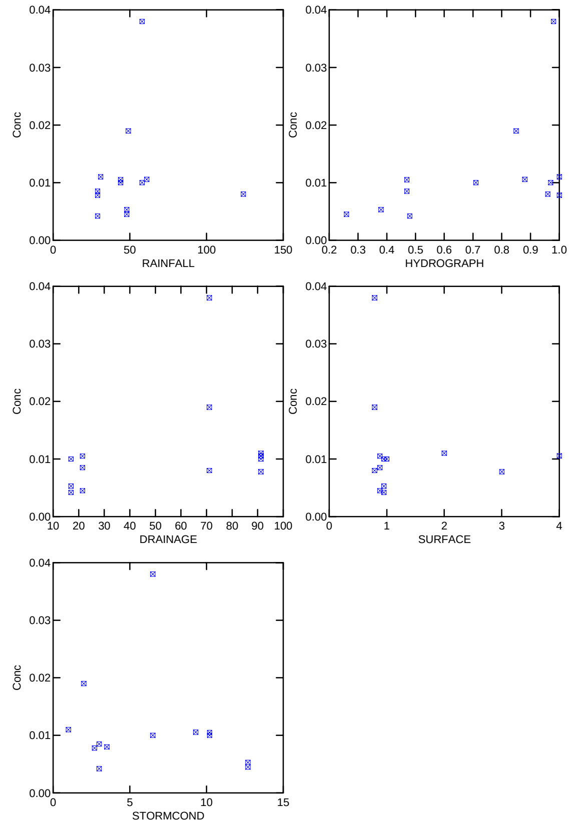


RECLASSIFIED REPRESENTATIVE LIGHT INDUSTRIAL Q-Q AND BOX PLOTS
ACENAPHTHYLENE, TOTAL

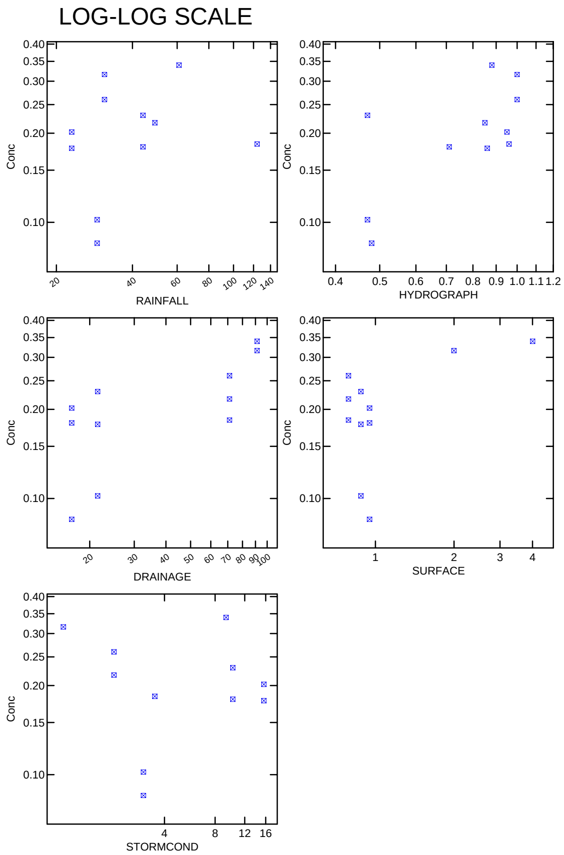
LOG-LOG SCALE

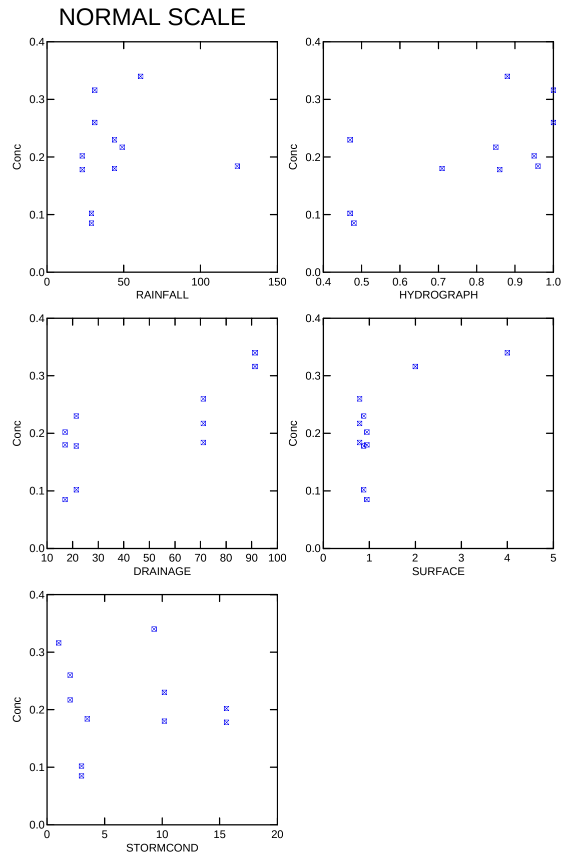


NORMAL SCALE



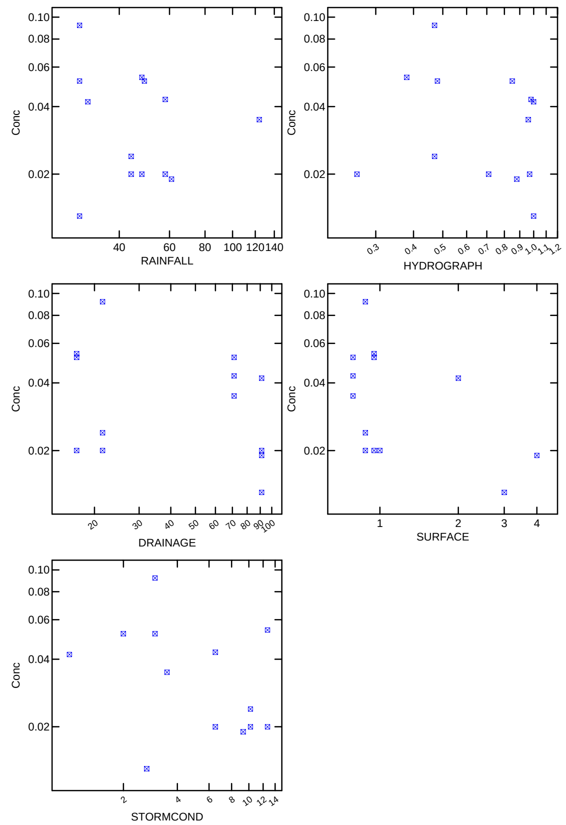
ARSENIC, DISSOLVED



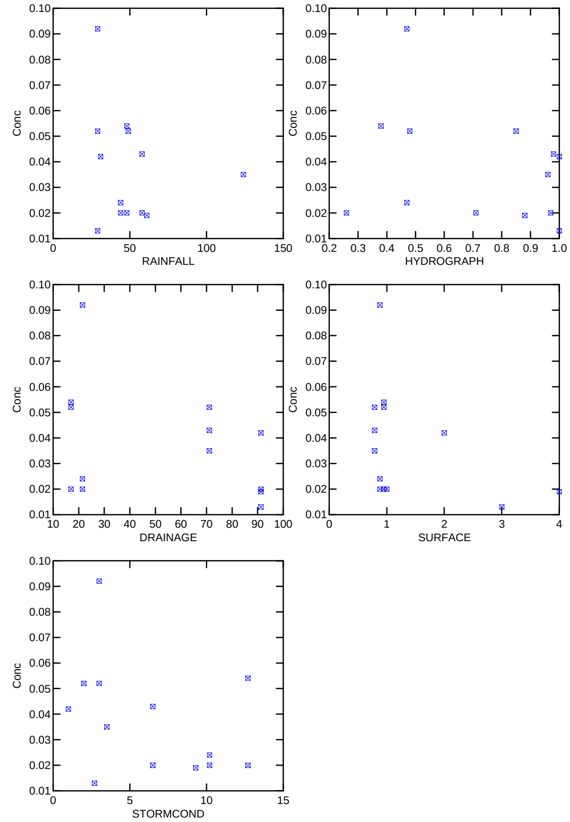


BENZO(A)PYRENE, TOTAL

LOG-LOG SCALE

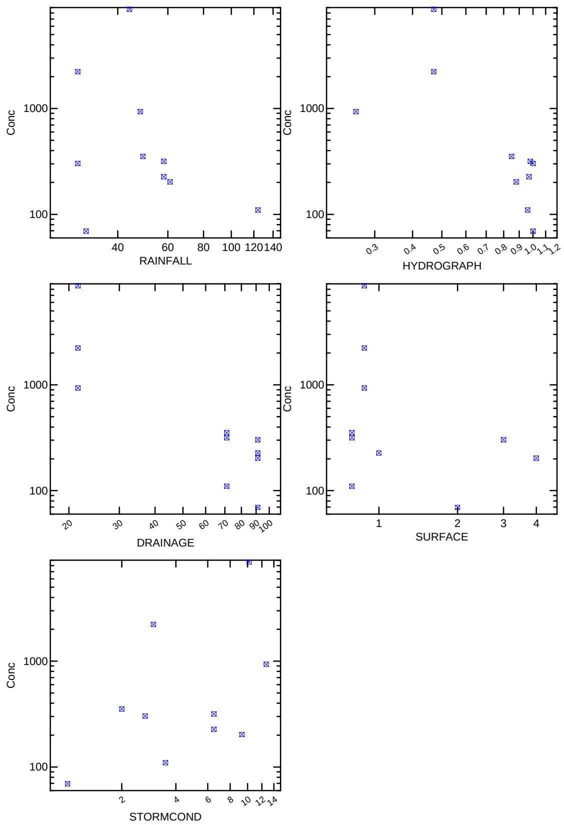


NORMAL SCALE



PCB-106, TOTAL

LOG-LOG SCALE



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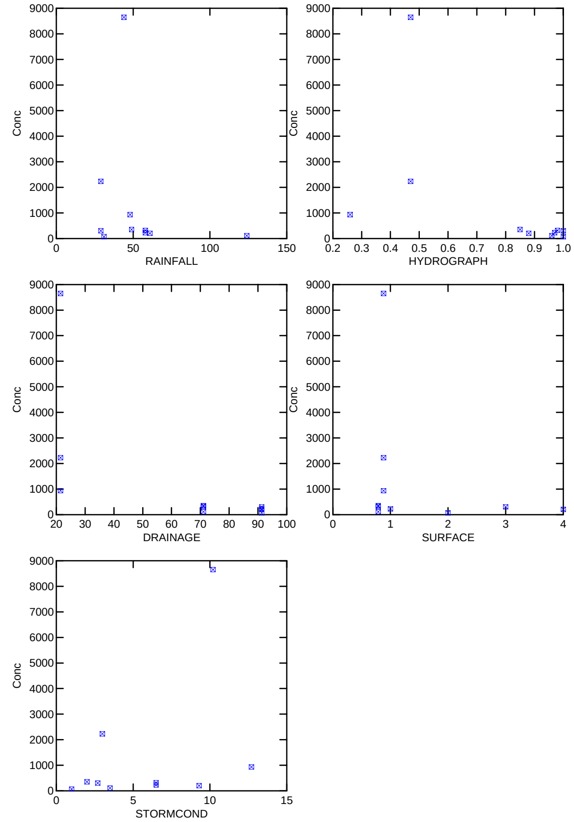
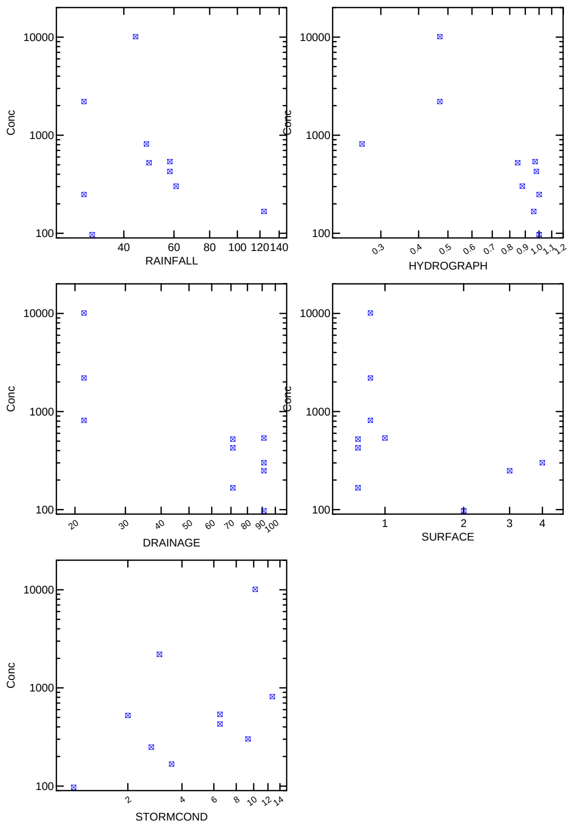


PCB-153, TOTAL

LOG-LOG SCALE



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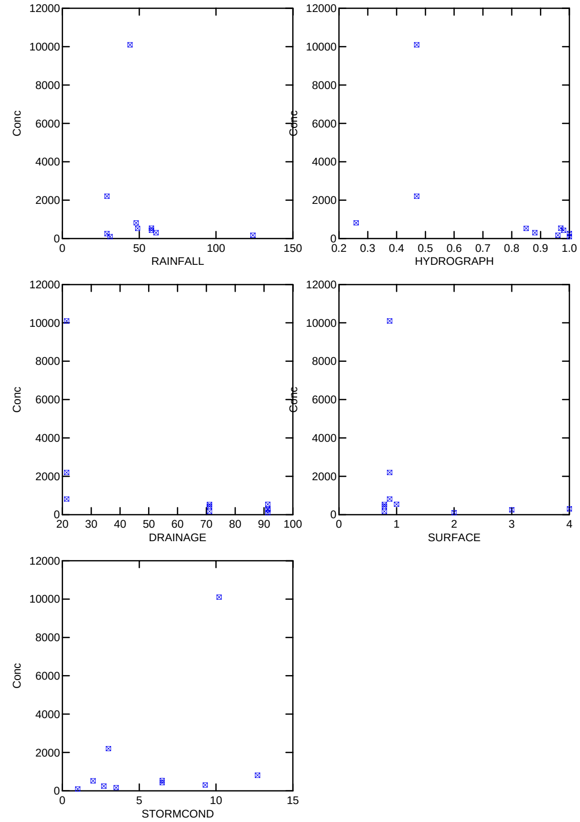
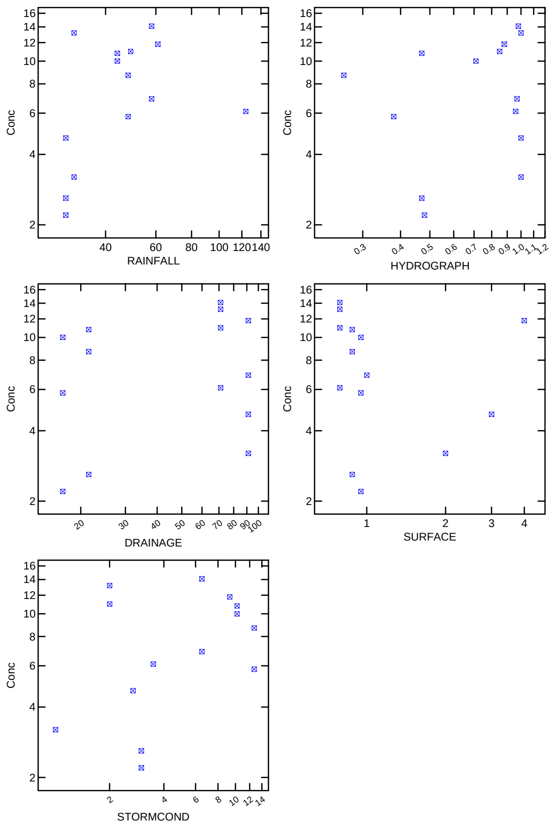


TOC

LOG-LOG SCALE



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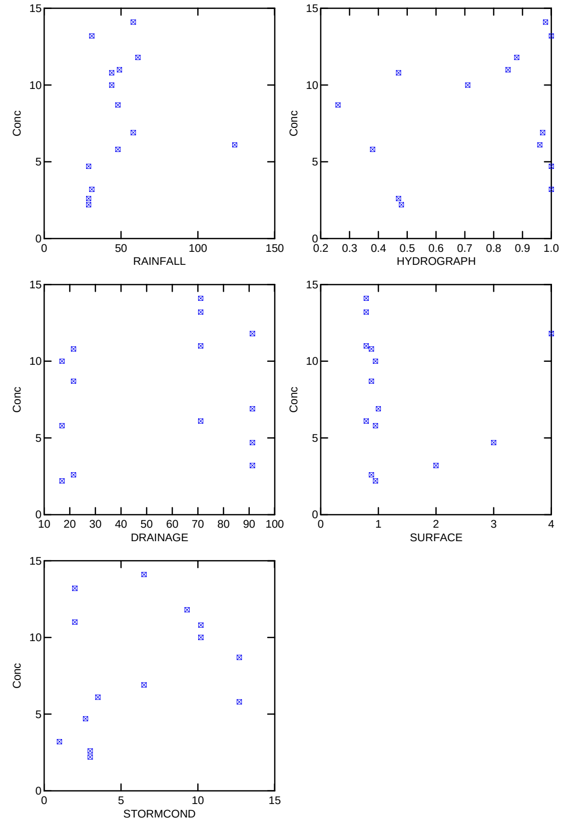

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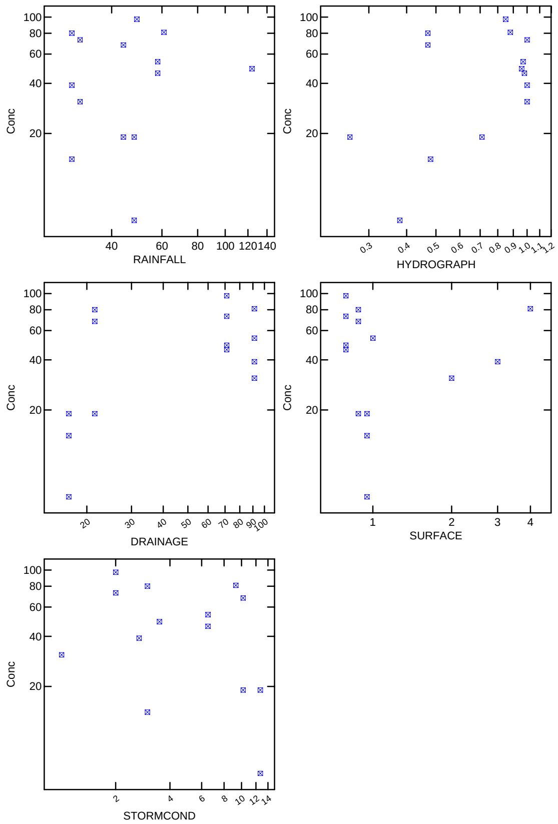
LOG-LOG SCALE



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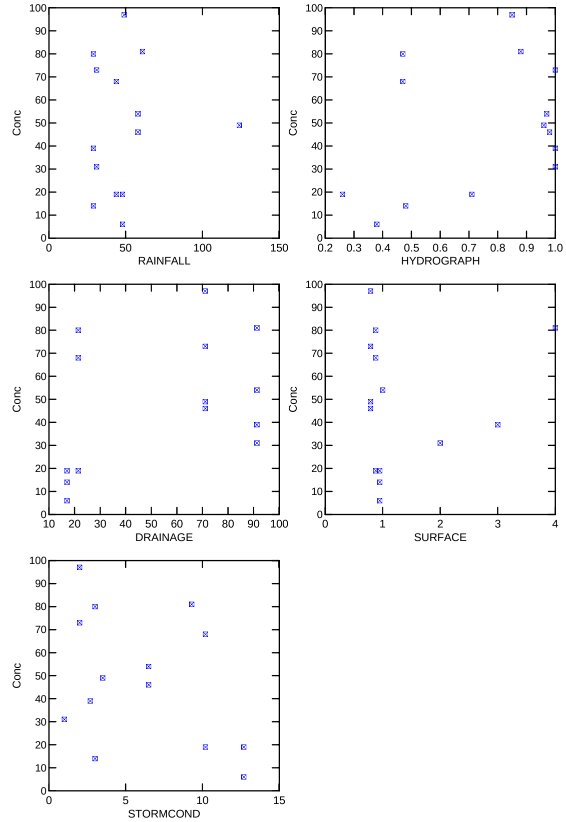
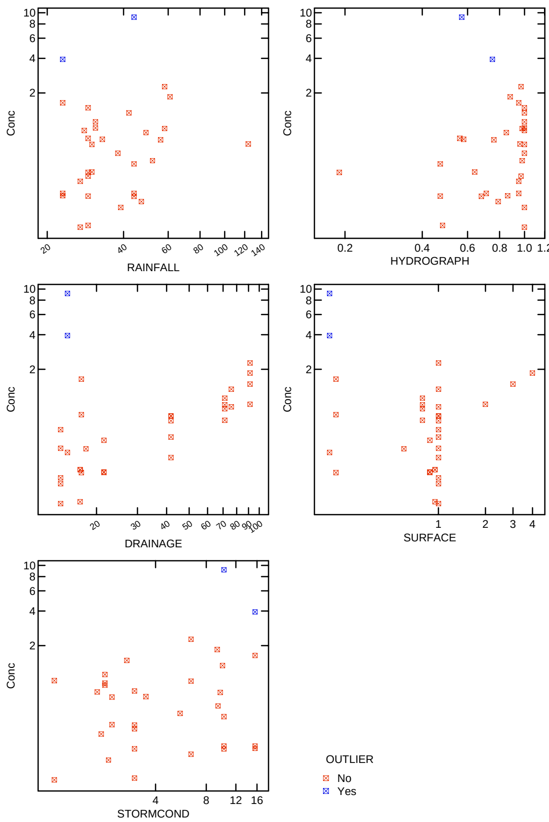


RECLASSIFIED REPRESENTATIVE HEAVY/LIGHT INDUSTRIAL Q-Q AND BOX PLOTS

ARSENIC, TOTAL

LOG-LOG SCALE



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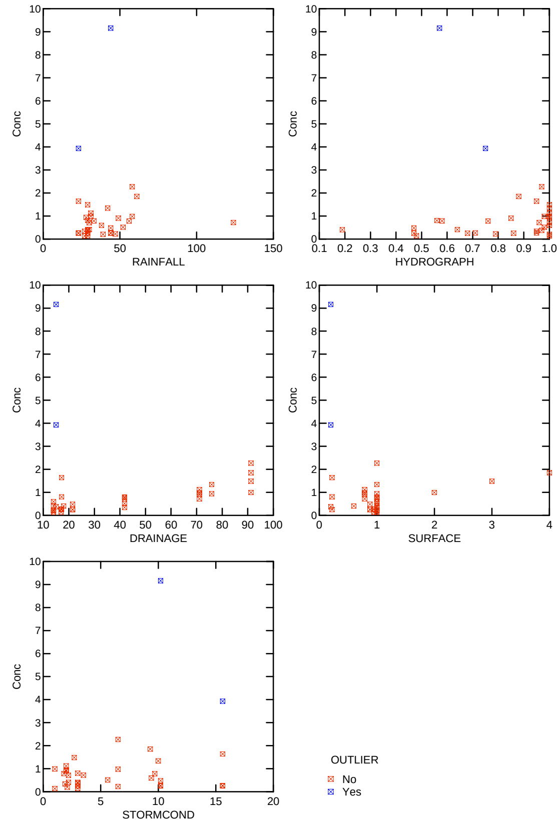

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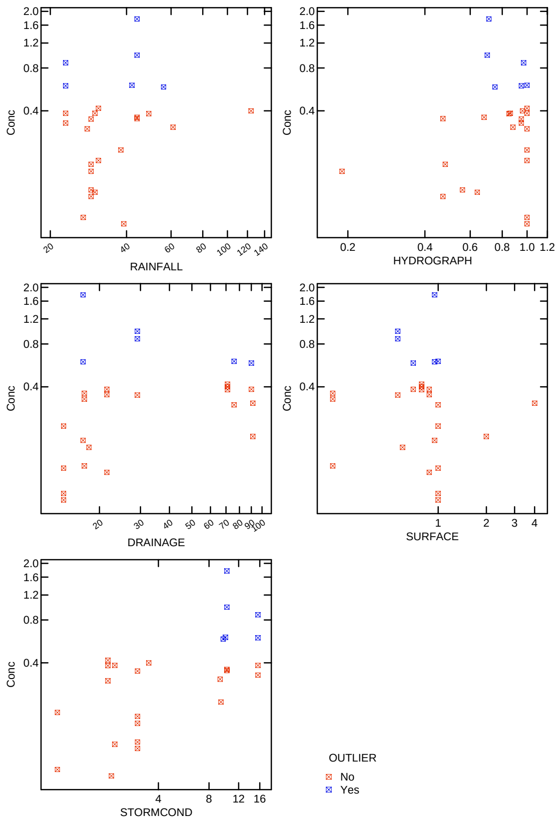

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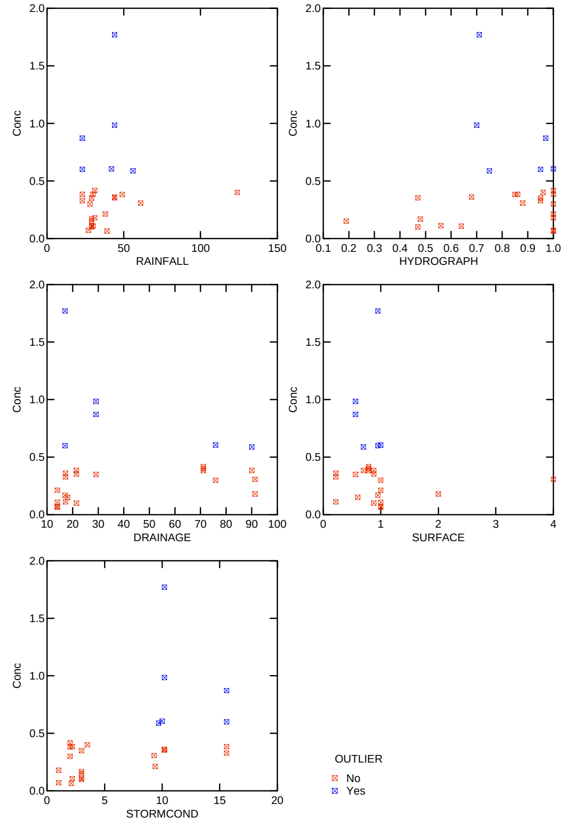

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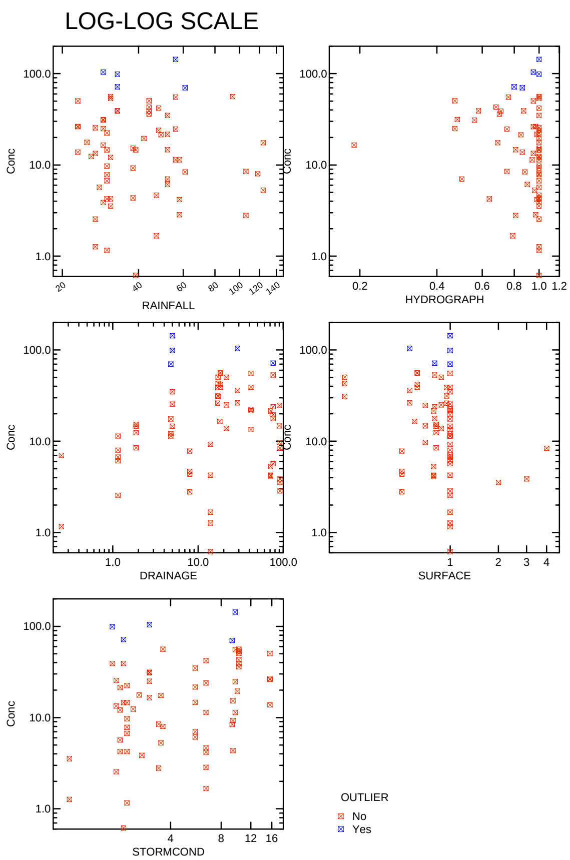
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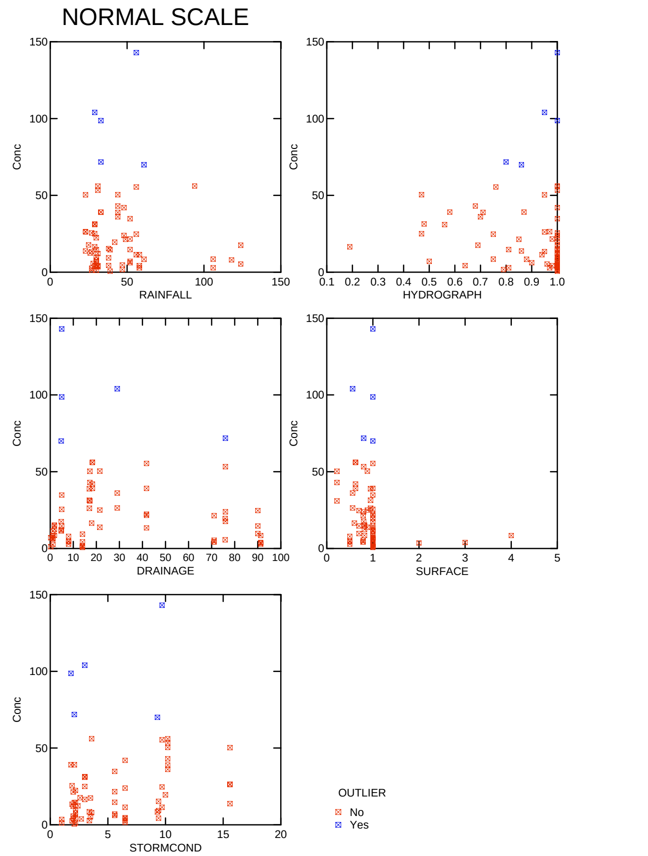
Conc
RAINFALL
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND
OUTLIER
No
Yes


NORMAL SCALE
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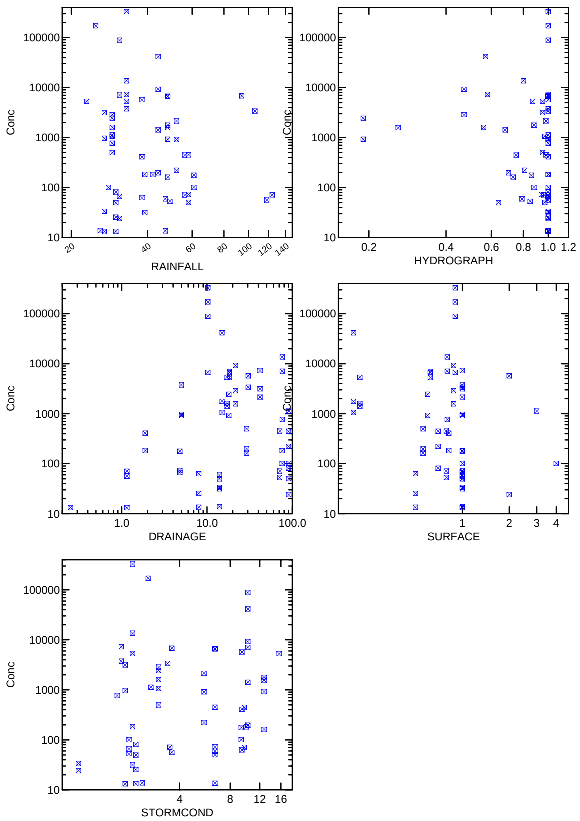
HYDROGRAPH
DRAINAGE
SURFACE
STORMCOND
OUTLIER
No
Yes

PCB-018, TOTAL

LOG-LOG SCALE



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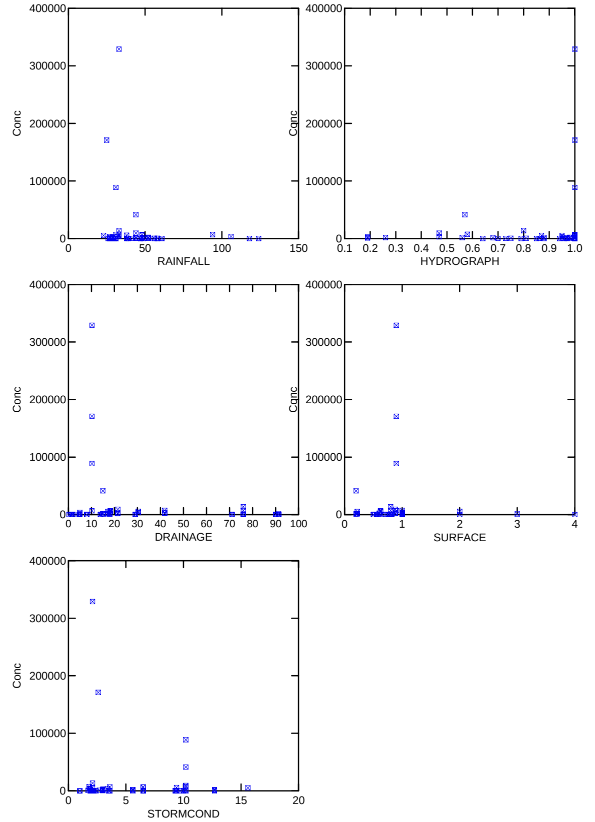
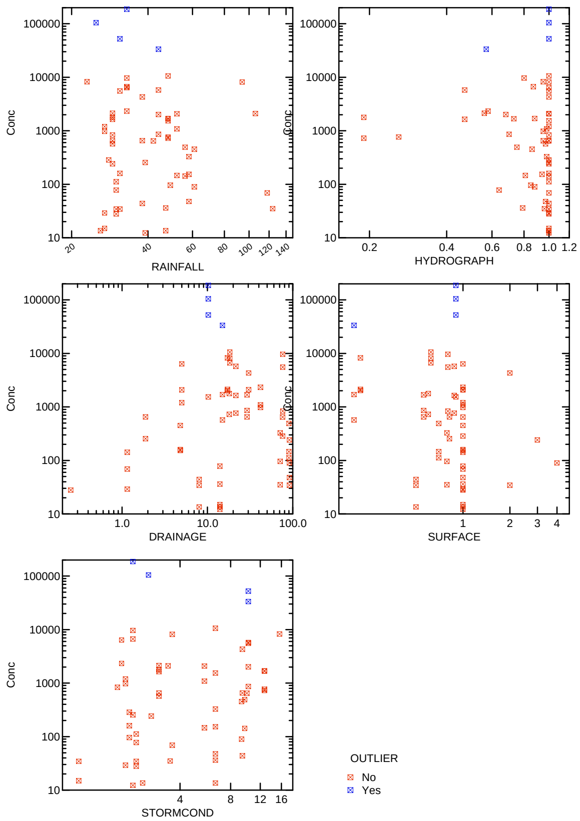
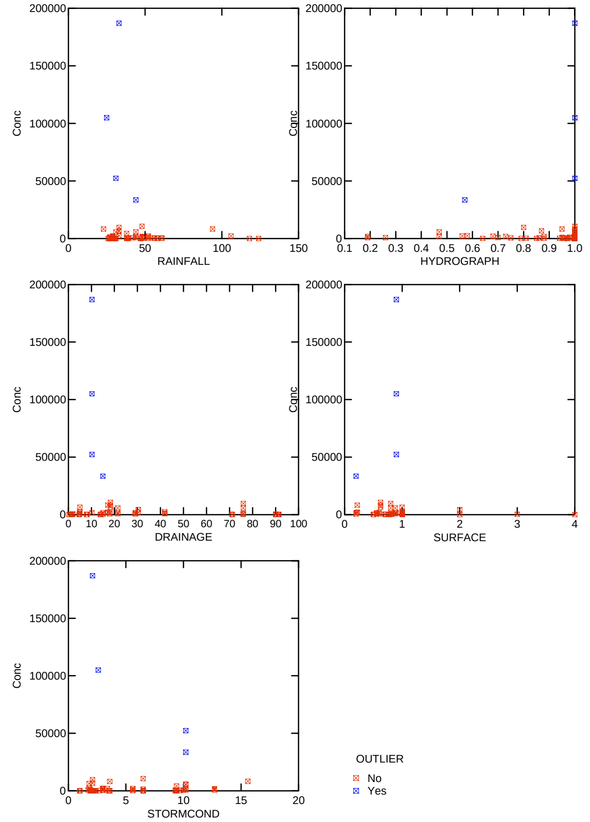


PCB-066, TOTAL

LOG-LOG SCALE

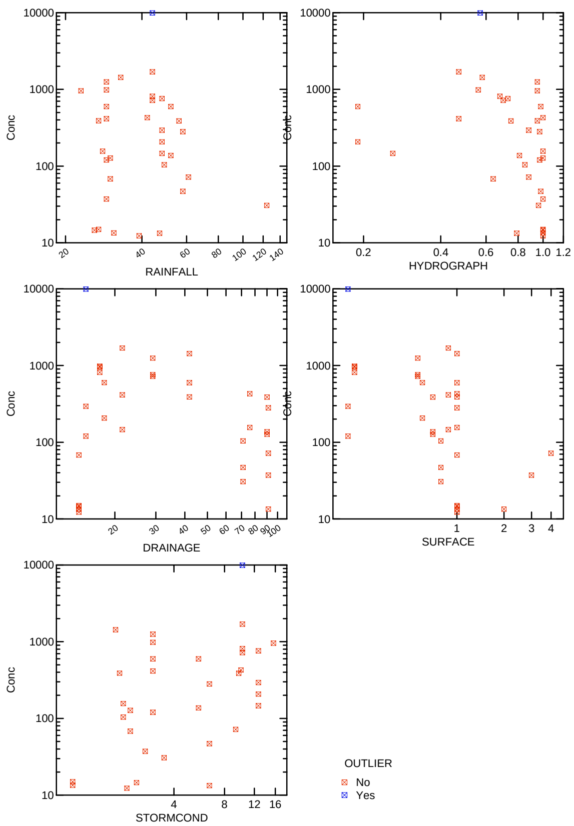


NORMAL SCALE

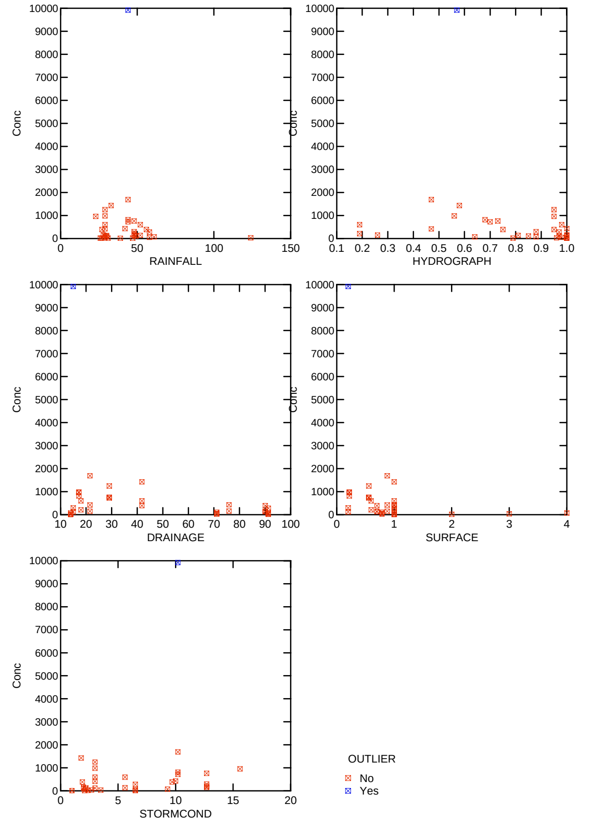


PCB-194, TOTAL

LOG-LOG SCALE



NORMAL SCALE



Appendix B

EPA-LWG Communications

APPENDIX B

EPA-LWG Communications

B-1. Anchor. 2007. Anchor email and attachment from Carl Stivers to Stormwater Technical Team dated October 16, 2007 regarding notes from October 16, 2007 Stormwater Technical Team Meeting. Anchor Environmental LLC. Seattle, Washington.

B-2. Anchor. 2007. Anchor email and attachment from Carl Stivers to Stormwater Technical Team dated November 12, 2007 regarding November 13, 2007 Stormwater Technical Team Meeting. Anchor Environmental LLC. Seattle, Washington.

B-3. Anchor. 2007. Anchor email from Carl Stivers to Stormwater Technical Team dated November 30, 2007 regarding notes from November 27, 2007 Stormwater Technical Team Meeting. Anchor Environmental LLC. Seattle, Washington.

B-4. EPA. 2007. EPA email to Lower Willamette Group dated December 13, 2007 (from K. Koch to C. Stivers) regarding December 19, 2007 Stormwater Technical Team Meeting. Environmental Protection Agency, Region 10. Seattle, Washington.

B-5. Anchor. 2007. Anchor email from Carl Stivers to Stormwater Technical Team dated December 20, 2007 regarding notes from December 19, 2007 Stormwater Technical Team Meeting. Anchor Environmental LLC. Seattle, Washington.

B-6. Anchor. 2008. Anchor email and attachment from Carl Stivers to Stormwater Technical Team dated January 14, 2008 regarding notes from January 10, 2008 Stormwater Technical Team Meeting. Anchor Environmental LLC. Seattle, Washington.

B-7. EPA. 2008. EPA letter and attachment to Lower Willamette Group dated March 24, 2008 (from E. Blischke and C. Humphrey to J. McKenna and R. Wyatt) regarding Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240 Status of Round 3 Sampling Activities. U.S. Environmental Protection Agency, Region 10. Portland, Oregon.

From:	Carl Stivers
Sent:	Tuesday, October 16, 2007 5:18 PM
To:	Carl Stivers; 'Koch.Kristine@epamail.epa.gov'; 'Andy Koulermos'; Amanda Shellenberger; 'Amanda Spencer'; 'Sanders, Dawn'; 'Scheffler, Linda'; 'Laura Jones'; 'mcoover@ensr.aecom.com'; 'LaFranchise, Nicole'; 'TARNOW Karen E'
Cc:	Bob Wyatt; Rick Applegate; 'MCCLINCY Matt'; Jessica Pisano; 'Gene Revelas'; 'Christine Hawley'; Jim McKenna
Subject:	Notes from Oct. 16 Stormwater Technical Team Meeting
Follow Up Flag:	Follow up
Flag Status:	Red
Attachments:	Data Needs Summary Oct 16.xls

Stormwater Technical Team –

Data Needs Summary Oct 16.xls

Here are the highlights and action items from today's call. We decided that the next meeting (in person for most folks) will be on November **13th from 12:30 to 3 pm.** A meeting location will be confirmed in a later email. The primary topic of discussion for this meeting will be the methods for loading calculations and estimates.

The primary topic of conversation for the Oct. 16 meeting was to finalize the data needs proposal. The attached table shows the data needs developed by the group. Note that there was disagreement on the need for sampling the T-4 site (WR-169) per the attached table, but the group agreed that we are requesting LWG discuss their position on sampling at this location in light of the Port's objections to this data need.

Note that the group also agreed that in general flow meters do not need to be deployed at sites where only sediment traps are being proposed. One exception, for WR-4, is noted in the attached table.

Please let me know ASAP if you have any objections or changes to this table before we provide it to the LWG Exec. for requested approval. I would like to send this to the LWG tomorrow if at all possible. Remember that any changes at this point need to be clear omissions or clarification based on the meeting discussions. Otherwise we would have to reconvene to discuss, which the current timeline does not allow.

Per the group's request, we are also working on an additional table that shows the fall/winter data collection ongoing or proposed for the T-4 and GE sites. This will come out in a later email.

It was agreed that the general path forward would be:

- Obtain official LWG approval/disapproval between Oct. 16 and October 31. Target date October 24.
- Assuming approval is provided, formalize proposal in a technical memo from Oct. 16 to October 31, with EPA approval to proceed on or about October 31. (Note that this memo would heavily reference the existing FSP and would only note those new items necessary to execute this additional proposed work.) After the meeting, I thought about this a little more, and I think the earliest that this FSP addendum would come to EPA for approval is November 1. So, we will be seeking EPA approval essentially as fast as possible.
- Deploy sediment traps from approximately Nov. 1 (depending on date of EPA approval) through Dec. 31
- Be on alert for storm events from approximately Nov. 1 (depending on data of EPA approval) through Dec. 31 and collect storms as possible per the FSP requirements.

Additional items and action items that were discussed:

- Per Merv's suggestion, Anchor will look into the ability to deploy twice the number (or possibly more) of sediment trap bottles at the fall sampling locations to improve sampling volumes.
- In addition to the general description of the fall sampling, the FSP addendum would describe only those items that differ from the existing FSP. Examples discussed include: prioritization changes of sediment trap analytes based on data available already as well as that flow meters will not be deployed at sediment trap only locations.
- Andy Koulermos will look into the status of the WR-169 sediment trap and stormwater sampling to see how this

might impact the requested LWG discussion on potentially sampling for PCBs at this site.

- For the next meeting:
    - Anchor/Integral will assess the distributions of stormwater data (assess for normality) and will provide a summary of this to the team prior to the next meeting.
    - Anchor will sort through options provided in the previous stormwater loading options description and propose a reasonable specific approach to facilitate discussions next time.
    - Anchor/Integral will discuss what form we currently have T-4 data and determine whether we need it in some other form to start to integrate it into the overall stormwater database.
    - Anchor/Integral will also discuss a proposed path forward for integrating these data and will report back on a proposed plan at the next meeting.

Let me know if I missed anything. Thanks much.

Carl

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Wenatchee, WA 98801
Phone: 509-888-2070
Fax: 509-888-2211

cstivers@anchorenv.com

No.	Station	Stormwater Events	Sediment Trap	Rationale	Other Notes
1	OF-22C	1		Only one open space station, and it is currently not complete for stormwater	
2	Hwy 30	3	1	Location inadvertantly included industrial drainage--not applicable to transportation	
2a	Hwy 30"B"	3	1	St. Johns Bridge site was recently re-paved and painted and may not be representative of overall transportation type	Hwy 30 and Reed St. appears to be a reasonable site, but will require reconnaissance to confirm.
3	OF-22B	1	1	Could be unique site for pesticides or PCBs and missing a storm for both and pesticides in sediments	Prioritize sediment traps for missing analytes (starting with pesticides)
4	OF-49	1	1	Only two residential sites and this one missing a storm for some analytes and almost all sediment analytes	Need all analytes in sediments
5	OF-18		1	Only one of two multiple land use sites and missing metals in sediment	Prioritize sediment traps for missing analytes (starting with metals)
6	WR-145/142	2	1	Only 1 storm for PCBs and missing almost all sediment analytes	Need all analytes in sediments
7	WR-96	1	1	Missing one storm for PCBs and two for herbicides and sediment traps missing all analytes	
8	WR-14		1	Missing most analytes in sediment	Prioritize traps for missing analytes.
9	WR-4		1	Missing most analytes in sediment	Prioritize traps for missing analytes. Place flow meter at this site as well due to process water discharges present here.
10	WR-161		1	Missing most analytes in sediment	Prioritize traps for missing analytes.
11	WR-123		1	Missing most analytes in sediment	Prioritize traps for missing analytes.
12	WR-147		1	Missing most analytes in sediment	Prioritize traps for missing analytes.
13	WR-218	1	1	Could be unique site for some chemicals and missing a storm and most sediment analytes	Prioritize sediment traps for missing analytes
14	WR-169?	3	1	PCB congeners in stormwater and possibly also sediment traps missing for this site. Data needed to support light industrial land use loading estimates.	There is a gap between the expectations of the LWG FSP and the T-4 FSP. **The Port expressed a general objection to the need for these data points.** It was agreed the Port would discuss this potential data need with the wider LWG to see if any compromises could be reached. One potential way to resolve the sediment trap data need is if there is sufficient sample from the already deployed T-4 sediment trap, an aliquot for PCB congeners could be provided. Also, the Port's ability to do any stormwater sampling may be contingent upon whether the scheduled fall storm event
Totals		12	13		
Previous Totals		9	12		

Yellow highlights indicate cells that changed from the Sep. 18 version of this table.

From: Carl Stivers
Sent: Monday, November 12, 2007 8:28 PM
To: Carl Stivers; Koch.Kristine@epamail.epa.gov; Andy Koulermos; Amanda Shellenberger; Amanda Spencer; Sanders, Dawn; Scheffler, Linda; Laura Jones; mcoover@ensr.aecom.com; LaFranchise, Nicole; TARNOW Karen E
Cc: Bob Wyatt; Rick Applegate; MCCLINCY Matt; Jessica Pisano; Gene Revelas; Christine Hawley; Jim McKenna
Subject: RE: Tomorrow's Stormwater Technical Team Meeting

All - Please see email from Andy below. Note I have been out of the office today and on the road tomorrow morning. So if you need hard copies please try to print them out at your offices before coming over to the meeting. Sorry for any inconvenience.

Carl

From: Andy Koulermos [mailto:akoulermos@newfields.com]
Sent: Mon 11/12/2007 1:20 PM
To: Carl Stivers
Subject: RE: Tomorrow's Stormwater Technical Team Meeting

Hey Carl:

I know it's early days in the data analysis, but I have taken a quick look at the TSS and PCB datasets for storm water and thought a quick discussion at the meeting tomorrow might help everyone get a little more comfortable with the big picture and help start discussions on data reduction and interpretations. The dataset looks quite promising to me.

Would you please distribute the attached to the tech team and bring paper copies tomorrow? If we have time I'd be happy to run through a few of the key concepts and see what ideas we can come up with for the path forward.

Thanks much.

Andy.

From: Carl Stivers
Sent: Mon 11/12/2007 9:27 AM
To: Koch.Kristine@epamail.epa.gov; Andy Koulermos; Amanda Shellenberger; Amanda Spencer; Sanders, Dawn; Scheffler, Linda; Laura Jones; mcoover@ensr.aecom.com; LaFranchise, Nicole; TARNOW Karen E
Cc: Bob Wyatt; Rick Applegate; MCCLINCY Matt; Jessica Pisano; Gene Revelas; Christine Hawley; Jim McKenna
Subject: Tomorrow's Stormwater Technical Team Meeting

Stormwater Technical Team -

This is to confirm our meeting tomorrow (Nov. 13) from 12:30 to 3:00pm at the City's Portland Building (1120 SW 5th Ave.). Please go to the 10th floor to sign in at reception. The meeting will be held on the 11th floor in the Redwood Room. There will be a conference phone available for those who opt to call in. (The call in number is 1-866-866-2244 with passcode 6761834#).

Also, attached is revised version of the loading methods that we sent around last time. Per our last call it has been revised to describe one potential specific approach to loading calculations (rather than all the options). I think we should also go over the loading methods that Kristine sent around recently. Laura and I will also provide a status up data on integration of T4 and GE data into the LWG database and an analysis of stormwater data distributions.

See you tomorrow.

Thanks.

Carl

One Potential Method for Stormwater Loading Analysis – Portland Harbor Superfund Site

Stormwater Data Loading Calculation

- Cw x Vyr = L
  - Cw - Measured Concentration (ug/L) for land use or site
  - Vyr - Volume of discharge from land use or site over a year (L/yr)
  - L - Load (ug/yr)
- Issues include storms or time of year sampled not representative of loading all year long.

Sediment Trap Data Loading Calculation

- Cs x TSS x Vyr = L
  - Cs - Measured Concentration (ug/kg) for land use or site
  - TSS - Total Suspended Sediments (kg/L) in stormwater measured for land use or site
  - Vyr - Volume of discharge from land use or site over a year (L/yr)
- Issues include time of year sediment traps deployed (e.g., spring) or TSS from storms not representative of loading all year long.

Determination of Inputs to Load Calculations

- Volume (Vyr) Variable
  - Model discharge for site or land use over a range of precipitation years (per rationale)
    - Use City Grid Model to generate volumes for each land use type within each segment of the river basin
- TSS variable
  - Develop TSS average, 5th percentile, and 95th percentile that are intended to represent range of TSS for that site or land use and apply to all chemical data
    - Use all program TSS data
    - Use historical TSS site data where available
      - QC screen historical data for appropriate quality
      - Use grabs and composites

Determination of Concentration (Cw/Cs) Inputs

- Associating Cw/Cs results with land uses and sites
  - Agree on final categories that each site falls into
  - Outlier site analysis to make sure site should be in land use category including removing data for the following reasons:
    - Remove outliers by chemical
    - Remove *A priori* based on unique known site uses/sources
    - Remove using statistical outlier approach (see Koch methods for tools)
  - Evaluate site-specific industrial sites for non-unique chemicals (e.g., use Gasco for industrial land use category for PCBs)

        - Identify non-unique chemicals for each site based on known site uses
        - Conduct outlier analysis as described above and remove outliers
        - Pool all remaining data in heavy industrial category
- Determining Cw/Cs values for each land use or site
    - Group all samples within category
    - Determine mean, geomean, 5th percentile and 95th percentile for each category by chemical
    - Handling of non-detects
        - Segregate out non-detected data well above (>2x) target DL
        - Use half DLs for all other non-detect data
- Determine basins where land use based approach cannot be used (per rationale) based on any of the following reasons:
    - Basin too small
    - Basin has too many unique sites
    - Calculate loads for these using standard approach and then assuming zero load to assess sensitivity of overall loading rates to these assumptions.
- For basins sampled near outfalls
    - Any station that samples more than 80% of the outfalls basin falls into this category
    - Calculate loads using both land use approach and a calculated using sampled data from that outfall
        - Compare loads from two methods – results inform uncertainty section discussion of loading analysis
        - If results are highly divergent, then calculate loadings as a range based on both methods (preserve range in in-river modeling)

Evaluation of Loading Estimates

- Compare stormwater loads to sediment trap loads
    - Total (water) vs. particulate (sediment) issue
    - Use both loads as part of loading sensitivity analysis to see how important distinction is
    - If results highly divergent, then calculate loadings as range based on both techniques
    - Preserve range information in uncertainty analyses of in-river fate and transport modeling
- Comparison of measured loads to those calculated on land use basis for some outfalls ("cross check" recommended in rationale)
    - See previous section for approach.

From: Carl Stivers

Sent: Friday, November 30, 2007 3:27 PM

To: 'Koch.Kristine@epamail.epa.gov'; 'Andy Koulermos'; Amanda Shellenberger; 'Amanda Spencer'; 'Sanders, Dawn'; 'Scheffler, Linda'; 'Laura Jones'; 'mcoover@ensr.aecom.com'; 'LaFranchise, Nicole'; 'TARNOW Karen E'

Cc: Bob Wyatt; Rick Applegate; 'MCCLINCY Matt'; Jessica Pisano; 'Gene Revelas'; 'Christine Hawley'; Jim McKenna; Valerie Oster

Subject: Notes from Stormwater Technical Team Meeting Nov. 27th at 12:30

Follow Up Flag: Follow up

Flag Status: Red

Stormwater Technical Team –

As discussed at the last meeting, here is a high level summary of action items and highlights:

- We agreed the next meeting should be Dec. 19 from 11 to 1 pm. This would be in person, in Portland, since we will want to project the data on the wall. I will set up a WebEx meeting for those who may need to call in. I will confirm the location soon. **Kristine** – If this time does not work for you, we also set up an alternate time for Dec. 20 (same time of day). Let me know which one works best for you.
- Sulzer – The group agreed that we would proceed with stormwater sampling but NOT sediment traps at Sulzer, due to deployment logistics. Anchor will work on a more detailed description of how the stormwater will be collected and flow will be monitored.
- New Hwy 30 Sample – It was agreed that the sample taken on Oct. 16th at the new Hwy 30 site could be used as a sample, even though sample representing about 4% of the flow from the middle of the storm was not collected.
- Load Calculation Methods – Methods for handling replicates and non-detects were discussed and Integral/Anchor will prepare data following these methods for use at the next call. The next call will work on the next steps in the loading calculation based on these data. It was agreed that this data analysis would concentrate on 4 PCB congeners, As, Pb, 2 PAHs, and TSS for the purposes of deriving methods.
- The Port is going to prepare on a Field Sampling Report similar to the one being prepared by the LWG for the spring sampling at the non-Port stations.
- Anchor to look for a statistician to attend the next meeting.
- Carl was going to look into the groups pace relative to the overall project schedule to make sure we are moving fast enough.

Let me know if I missed anything critical.

Thanks.

Carl

Carl Stivers

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cstivers@anchorenv.com

From: Carl Stivers
Sent: Monday, November 19, 2007 1:12 PM
To: 'Koch.Kristine@epamail.epa.gov'; 'Andy Koulermos'; Amanda Shellenberger; 'Amanda Spencer'; 'Sanders, Dawn'; 'Scheffler, Linda'; 'Laura Jones'; 'mcoover@ensr.aecom.com'; 'LaFranchise, Nicole'; 'TARNOW Karen E'
Cc: Bob Wyatt; Rick Applegate; 'MCCLINCY Matt'; Jessica Pisano; 'Gene Revelas'; 'Christine Hawley'; Jim McKenna; Valerie Oster
Subject: Stormwater Technical Team Meeting Nov. 27th at 12:30 to 4 pm

Stormwater Technical Team –

At our last meeting, we decided to have our next in person meeting on Nov. 27th from 12:30 to 4 pm. I have secured Room 1904 at the offices of Schwabe, Williamson, Wyatt, which is at 1211 SW Fifth Avenue. We will continue our discussions of stormwater loading calculation methods.

In case someone cannot make it, the following call in number is also available:

1-866-866-2244
6761834#

Thanks.

Carl

Carl Stivers
Anchor Environmental, L.L.C.
23 South Wenatchee Avenue, Suite 120
Wenatchee, WA 98801
Phone: 509-888-2070
Fax: 509-888-2211

cstivers@anchorenv.com

From: Koch.Kristine@epamail.epa.gov <Koch.Kristine@epamail.epa.gov>
To: Carl Stivers <cstivers@anchorenv.com>
CC: humphrey.chip@epamail.epa.gov <humphrey.chip@epamail.epa.gov>; blischke.eric@epa.gov <blischke.eric@epa.gov>; rjw@nwnatural.com <rjw@nwnatural.com>; RICKA@BES.CI.PORTLAND.OR.US <RICKA@BES.CI.PORTLAND.OR.US>; McKenna, James (Jim); ANDERSON.Jim@deq.state.or.us <ANDERSON.Jim@deq.state.or.us>
Sent: Thu Dec 13 13:08:52 2007
Subject: Re: Stormwater Technical Team Meeting Dec. 19th 11am to 2 pm

Carl - I see the process for the loading calculations as being similar to that for the FSP development. This meeting should be for getting the big picture process forward, not the details, which is similar to the FSP development where the team determined the process for stormwater collection (type of samples, analytes, locations, etc.). I see the next step as LWG (probably you) developing a technical memo providing details or loading approach and having the team review and comment before being sent to LWG exec and then to agencies for approval (Again, similar to the processes used for FSP development). Therefore, the meeting should be very focussed on the big picture process (steps necessary to get from data to loading). The key will be trying to keep the techies out of the weeds - might help to have a structured agenda.

Kristine Koch
Remedial Project Manager
USEPA, Office of Environmental Cleanup

U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900, M/S ECL-115 Seattle, Washington 98101-3140

(206)553-6705
(206)553-0124 (fax)
1-800-424-4372 extension 6705 (M-F, 8-4 Pacific Time, only)

"Carl Stivers" <cstivers@anchorenv.com>

12/13/2007 12:52 PM

To
"Scheffler, Linda" <LindaSC@BES.CI.PORTLAND.OR.US>, "Amanda Shellenberger" <ashellenberger@anchorenv.com>, Kristine Koch/R10/USEPA/US@EPA, "Andy Koulermos" <akoulermos@newfields.com>, "Amanda Spencer" <aspencer@ashcreekassociates.com>, "Sanders, Dawn" <DAWNS@BES.CI.PORTLAND.OR.US>, "Laura Jones" <ljones@integral-corp.com>, <mcoover@ensr.aecom.com>, "LaFranchise, Nicole" <Nicole.LaFranchise@portofportland.com>, "TARNOW Karen E" <TARNOW.Karen@deq.state.or.us>

cc
"Bob Wyatt" <rjw@nwnatural.com>, "Rick Applegate" <RICKA@bes.ci.portland.or.us>, "MCCLINCY Matt"

<MCCLINCY.Matt@deq.state.or.us>,
"Jessica Pisano"
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"Christine Hawley"
<chawley@integral-corp.com>, "Jim McKenna"
<Jim.McKenna@portofportland.com>,
"Valerie Oster"
<voster@anchorenv.com>

Subject
Stormwater Technical Team Meeting Dec. 19th 11am to 2 pm

Stormwater Technical Team -

We will be meeting on Dec. 19th from 11 am to 2 pm at Schwabe (1211 SW Fifth Avenue) to discuss the next parts of the loading calculations.

I urge everyone to attend in person if possible. If not, please use the following conference call number:

1-866-866-2244
6761834#

Also, I have set up a WebEx meeting, which you can access as follows:

You have been invited to join a meeting on the Web, using WebEx MeetMeNow.

Please click the following link to join the meeting:
< https://mwmus.webex.com/mwmus/jm.php?PWD=&MK=942000850 >

MEETING PASSWORD: No password
Date: December 19, 2007
Time: 11:00 am, Pacific Standard Time (GMT -08:00, San Francisco)
Teleconference: No teleconference
Meeting Number: 942 000 850

http://meetmenow.webex.com <http://meetmenow.webex.com/> We've got to start meeting like this(TM)

Carl Stivers
Anchor Environmental, L.L.C.
23 South Wenatchee Avenue, Suite 120
Wenatchee, WA 98801
Phone: 509-888-2070
Fax: 509-888-2211
cstivers@anchorenv.com

From: Carl Stivers

Sent: Thursday, December 20, 2007 4:52 PM

To: 'Scheffler, Linda'; Amanda Shellenberger; 'Koch.Kristine@epamail.epa.gov'; 'Andy Koulermos'; 'Amanda Spencer'; 'Sanders, Dawn'; 'Laura Jones'; 'mcoover@ensr.aecom.com'; 'LaFranchise, Nicole'; 'TARNOW Karen E'

Cc: Bob Wyatt; Rick Applegate; 'MCCLINCY Matt'; Jessica Pisano; 'Gene Revelas'; 'Christine Hawley'; Jim McKenna; Valerie Oster; 'Lucinda Tear'

Subject: Notes from Stormwater Technical Team Meeting Dec. 19th 11am to 2 pm

Follow Up Flag: Follow up

Flag Status: Red

Stormwater Technical Team –

Here are the highlights from our last meeting. Note that any agreements noted need to be ratified by the LWG Exec. As always let me know if I missed something. The group agreed to meet again either Jan 9th or 10th from 11 am to 2 pm. **Kristine – please confirm a preferred date** as soon as possible**.**

- Fall sampling status – It was agreed that shorter sediment trap bottles should be deployed at those locations with only trace sediments after 1 month of deployment and that also have flow height issues. (For example, we would not use short bottles in catch basins, because even taller bottles are always inundated and short bottles would make no difference.) It was also agreed that both short and regular sized bottles (2 each) should be redeployed to OF-18 and each bottle type analyzed for Total Organic Carbon, to help check whether shorter bottles collect a sediments differently from standard bottles. The exact new size of short bottle was not determined, but Anchor was given leeway to decide on something with the goal of minimizing the number of variations from standard sized bottles.
- Data reporting – Anchor requested that only one data report be prepared that encompassed both the spring and fall sampling results. The group agreed to this with the understanding that the actual data would be available through database postings as it becomes available post validation.
- Schedule – Various potential pathways to loading estimates were discussed. All permutations discussed require that loading methods decisions be completed by mid-January and that loading estimates need to be available for Fate and Transport modeling by the start of June. Kristine indicated EPA was expecting an approval process similar to approval of the FSP as follows:
    - Group decides on general loading estimate methods by mid-January
    - Anchor/Integral prepare a draft loading methods plan
    - EPA/Stormwater Team review, discuss, and provide input iteratively in period between mid-January and mid-April including LWG Exec. approval step
    - Target EPA approval date of mid-April.
    - Anchor/Integral conduct loading calculations mid-April to mid-June

  [I'd like to add that obviously Anchor/Integral would need some time in this period to create the initial draft (late Jan./early Feb timeframe) and LWG and EPA will need some time to officially approve it (say late March and early April). Thus, the actual Stormwater Team iterative refinement process would need to occur from about mid-February through mid-March.]
  It was also agreed that Carl should work with the City simultaneously in early January determine the mechanics of using the City grid model.
- Loading Methods – The following general approaches were agreed to:
    - All lab and field duplicates will be kept separate in the SCRA database so that widely divergent duplicates can be identified and more closely assessed. Integral will repost the SCRA consistent with this agreement.
    - In general, relatively consistent duplicates will be combined (e.g., averaged) before further interpretation of results. However, widely divergent duplicates will be examined to determine if an error or cause can be identified. Also, they will generally be assessed to see if a result is an outlier.

Divergent results may be eliminated from further use based on these assessments.

- It was agreed that summing rules (e.g., for total PCBs) are not needed because only individual chemicals will be subject to loading estimates.
- It was agreed that treatment of non-detects for statistical calculations will be based on EPA's Pro UCL program, where sample numbers are sufficient. More simple methods will need to be used for smaller data sets. The critical concept in all cases is to look at the ratio and number of non-detects relative to detects to discern the importance of non-detect handling decisions. The percentage of data points coming from non-detects will always be clearly reported.
- Placement of stations within land use categories was discussed and the following was agreed to:
  - The St. John's Bridge results will be compared to the two fall highway site results to determine whether the bridge is similar to these other sites and should be included in the transportation land use category.
  - OF-22B should be considered a unique site for pesticides
  - An outlier analysis should be done for heavy industrial category sites to see if any of these sites should be considered unique heavy industrial sites for any chemicals.
  - The distributions of heavy industrial category sites and unique heavy industrial sites should be compared. Where two groups have similar distributions, some unique sites for some chemicals might be included in the heavy industrial land use category.
- Note that there was concern that perhaps individual points from unique heavy industrial sites should not given equal weight if they are used in the heavy industrial land use category. It was agreed that more discussion was needed next time on use of individual data points within each category and whether they can be all considered equivalent or not, for a number of reasons.

Thanks.

Carl

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From: Carl Stivers
Sent: Thursday, December 13, 2007 12:52 PM
To: 'Scheffler, Linda'; Amanda Shellenberger; 'Koch.Kristine@epamail.epa.gov'; 'Andy Koulermos'; 'Amanda Spencer'; 'Sanders, Dawn'; 'Laura Jones'; 'mcoover@ensr.aecom.com'; 'LaFranchise, Nicole'; 'TARNOW Karen E'
Cc: Bob Wyatt; Rick Applegate; 'MCCLINCY Matt'; Jessica Pisano; 'Gene Revelas'; 'Christine Hawley'; Jim McKenna; Valerie Oster
Subject: Stormwater Technical Team Meeting Dec. 19th 11am to 2 pm

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MEETING PASSWORD: No password
Date: December 19, 2007
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Teleconference: No teleconference
Meeting Number: 942 000 850

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We've got to start meeting like this(TM)

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From: Carl Stivers
Sent: Monday, January 14, 2008 12:43 PM
To: 'Koch.Kristine@epamail.epa.gov'; Amanda Shellenberger; 'Sanders, Dawn'; 'Andy Koulermos'; 'Amanda Spencer'; 'mcoover@ensr.aecom.com'; 'Scheffler, Linda'; 'Lucinda Tear'; 'LaFranchise, Nicole'; 'TARNOW Karen E'; 'Laura Jones'
Cc: 'Christine Hawley'; 'Gene Revelas'; Jim McKenna; Jessica Pisano; 'MCCLINCY Matt'; Rick Applegate; Bob Wyatt; Valerie Oster
Subject: Notes from Jan. 10th meeting

Follow Up Flag: Follow up
Flag Status: Red

Attachments: Storm Notes Jan 10 2008.doc

Stormwater Technical Team –

We agreed to have our next call on February 7th starting at noon. This will be a conf. call and not an in person meeting. I will send out a call number when we are closer to the date. The purpose of the next meeting will be to make final decisions on the sediment trap samples, which will be collected at the end of the month. Anchor/Integral will send out the most recent information on sediment trap accumulations and total solids content prior to the meeting. Note that the total solids information will be sent out just before the call because that is when it will be available.

It was also agreed that LWG consultants would work on writing up a Loading Calculation Method Plan based on agreements from the last two meetings. Attached are my notes on our agreed to approaches from this meeting. Please let me know if I missed something. Other ideas relevant to the plan that were discussed include:

- Development of a summary diagram or table on study approach and ultimate objectives for the loading rates (this would probably go in the plan).
- Table matrix of supporting data available to understand stormwater concentration data distributions (again would probably be presented in the plan)
- Development of an example GRID model output for runoff volumes needed for the calculations. This will be discussed with the City to refine the output requirements as necessary to fit with the capabilities of the GRID model.

I currently anticipate that a draft of the plan will be available in late February. We discussed mid-February previously, but given all of the data/statistical analyses that will be conducted to understand the data distributions, I am now thinking this could take a little longer.

Thanks.

Carl

Storm Notes Jan 10 2008.doc

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cstivers@anchorenv.com

From: Carl Stivers
Sent: Wednesday, January 09, 2008 1:44 PM
To: 'Koch.Kristine@epamail.epa.gov'; Amanda Shellenberger; 'Sanders, Dawn'; 'Andy Koulermos'; 'Amanda Spencer'; 'mcoover@ensr.aecom.com'; 'Scheffler, Linda'; 'Lucinda Tear'; 'LaFranchise, Nicole'; 'TARNOW Karen E'; 'Laura Jones'
Cc: 'Christine Hawley'; 'Gene Revelas'; Jim McKenna; Jessica Pisano; 'MCCLINCY Matt'; Rick Applegate; Bob Wyatt; Valerie Oster
Subject: Stormwater Technical Team meeting Jan. 10th (tomorrow) from 11 am to 2 pm

Stormwater Technical Team -

As previously agreed, we are meeting tomorrow at 11 am at the offices of Schwabe, Williamson, Wyatt at 1211 SW Fifth Avenue. I don't have a room number yet, so please inquire at the front desk on the 19th floor.

For those calling in the phone number is:

1-866-866-2244
6761834#

Given what we discussed last time there is only one major agenda item. I think we should spend all our time on the remaining elements of the loading methods that we have not covered yet. General issues that still need discussion include:

- Use of individual concentration data points within each category
- Outlier analysis (if any) within each category of concentration data
- Statistics on concentration data to generate for each category (and for unique sites)
- Basins appropriate and inappropriate to use land use based approach
- TSS data to be used in loading rates from sediment traps and how to apply
- Use of sediment traps and/or stormwater concentration data
- Use of measured loads vs. land use extrapolated for large basins that were sampled directly

There may be other issues to add (or more details with these), and we can discuss other issues as people suggest.

Note for tracking purposes, items that have already been discussed (and we should try to not re-visit unless absolutely necessary) are:

- Treatment of lab and field duplicates
- Summing rules (not applicable)
- Treatment of non-detects
- Placement of stations within categories

See you all tomorrow.

Thanks.

Carl

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-----Original Message-----
From: Carl Stivers
Sent: Friday, December 21, 2007 11:22 AM
To: 'Koch.Kristine@epamail.epa.gov'
Cc: Andy Koulermos; Amanda Shellenberger; Amanda Spencer; Christine Hawley; Sanders, Dawn; Gene Revelas; Jim McKenna; Jessica Pisano; Scheffler, Linda; Laura Jones; Lucinda Tear; MCCLINCY Matt; mcoover@ensr.aecom.com; LaFranchise, Nicole; Rick Applegate; Bob Wyatt; TARNOW Karen E; Valerie Oster
Subject: Next meeting Jan. 10th from 11 am to 2 pm

Stormwater Technical Team -

This is to confirm that our next meeting will be on Jan. 10th from 11 am to 2 pm. I think we all see value in having these meetings in person. I will get a meeting room and conf. number and notify everyone of those details in the near future.

Thanks.

Carl

Carl Stivers
Anchor Environmental, L.L.C.
23 South Wenatchee Avenue, Suite 120
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Phone: 509-888-2070
Fax: 509-888-2211
cstivers@anchorenv.com

-----Original Message-----
From: Koch.Kristine@epamail.epa.gov [mailto:Koch.Kristine@epamail.epa.gov]
Sent: Friday, December 21, 2007 10:57 AM
To: Carl Stivers
Cc: Andy Koulermos; Amanda Shellenberger; Amanda Spencer; Christine Hawley; Sanders, Dawn; Gene Revelas; Jim McKenna; Jessica Pisano; Scheffler, Linda; Laura Jones; Lucinda Tear; MCCLINCY Matt; mcoover@ensr.aecom.com; LaFranchise, Nicole; Rick Applegate; Bob Wyatt; TARNOW Karen E; Valerie Oster
Subject: Re: Notes from Stormwater Technical Team Meeting Dec. 19th 11am to 2 pm

Carl - The 10th is my preferred date - Do I need to travel to Portland?
Also, on January 28th, I'm taking in-house training on interpreting non-detect data correctly that may be helpful to the team, so I can follow-up after that.

Kristine Koch
Remedial Project Manager
USEPA, Office of Environmental Cleanup

U. S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900, M/S ECL-115
Seattle, Washington 98101-3140

(206)553-6705
(206)553-0124 (fax)
1-800-424-4372 extension 6705 (M-F, 8-4 Pacific Time, only)

Agreed To Methods or Evaluation Processes for Stormwater Load Calculations

- Agreed that large end of pipe basins are for cross check with land use extrapolated loads only (this includes OF-18, OF-19, and old HWY30)
- Regarding population determination within land use categories:
    - Conduct an outlier analysis first, based on the categorizations agreed to last time
    - Evaluate overlap by chemical between heavy and light industrial categories (potential combining of categories if indicated)
    - Look at variables that might impact data distributions observed to identify reasons for outliers that may indicate a need for removal (or other use) of outliers including:
        - Site drainage size
        - Antecedent storm conditions
        - Impervious surface area
        - Storm sampling coverage
        - Sampling artifacts
        - Groupings of data by site that are unique or different
        - No. of samples in the category
        - Rainfall amount of sampled storm
        - Relationship of TOC to chemical concentrations
        - Relationship of TSS/Rainfall to chemical concentrations
        - Non-stormwater discharges present in sample
        - Amount of baseflow present in sample
- Calculate central tendency for each chemical within each category (or site for unique sites) plus a range of statistics so they are available for future F&T model runs
- Do not use the Spring Sulzer data for anything unless we find out what this outfall drains
- Use study TSS data only for sediment trap loading calculations
    - Use other TSS data from site only as comparison to understand how unusual study TSS data may be
    - Similarly, compare land use City MS4 TSS data to study land use category TSS data
- Pool sediment trap and TSS data within each land use category and calculate loads:
    - Based on a straight TSS values
    - Based on TOC normalized values
    - Using spring data for fall traps where no fall TSS data are available
- Compare average of measured stormwater concentrations to calculated stormwater concentrations from sediment trap/TSS data
    - Are trap calculated concentrations very different from measured stormwater concentrations?
    - If so, use sediment trap loads in F&T model as well as part of sensitivity analysis
    - If not, pick load statistic from stormwater loads per above

- Agreed to monthly runoff calculations of volume for each of F&T model years.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
OREGON OPERATIONS OFFICE
805 SW Broadway, Suite 500
Portland, Oregon 97205

March 24, 2008

Mr. Jim McKenna
Port of Portland & Co-Chairman, Lower Willamette Group
121 NW Everett
Portland, Oregon 97209

Mr. Robert Wyatt
Northwest Natural & Co-Chairman, Lower Willamette Group
220 Northwest Second Avenue
Portland, Oregon 97209

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240
Status of Round 3 Sampling Activities

Dear Messrs. Wyatt and McKenna:

The Lower Willamette Group (LWG) has requested documentation from EPA that Round 3B data collection activities at the Portland Harbor site have been completed. EPA concurs that all Round 3B data collection activities associated with the following approved Field Sampling Plans (FSPs) have been completed:

- Round 3B Comprehensive Sediment and Bioassay FSP (conditionally approved on November 9, 2007);
- The Round 3B FSP for Fish and Invertebrate Tissue and Collocated Surface Sediment (approved on December 3, 2007);
- The Round 3 Groundwater Pathway Assessment, FSP for Stratigraphic Assessment and Transition Zone Water Sampling – Gunderson (approved on October 11, 2007);
- The Round 3A Stormwater FSP Addendum (approved November 6, 2007);
- The Round 3 Lamprey Toxicity FSP Addendum (approved August 17, 2007);

The attached Table 1 summarizes the status of all Round 3A and 3B data collection activities. As indicated in the table, there are three outstanding data collection efforts:

<u>The Round 3B Side Scan Sonar Field Sampling Plan</u>: The side-scan sonar data collection effort is primarily for the purpose of debris identification to support the Portland Harbor feasibility

study. The Side-Scan Sonar FSP was submitted to EPA on January 18, 2008. EPA provided comments on this document on March 13, 2008.

The Round 3B Sediment Mobility Study: A proposal for performing sediment mobility testing was submitted on December 11, 2007. EPA provided comments on this proposal on January 24, 2008. A Sediment Mobility FSP is expected on March 24, 2008.

The Collection of Bird Eggs: EPA believes that osprey eggs may serve as a useful long-term monitoring tool following cleanup activities at the Portland Harbor site. EPA also believes that a unique opportunity exists to partner with work being proposed by the Portland Harbor Natural Resource Trustee Council, the United States Geological Survey (USGS) and the U.S. Fish and Wildlife Service. Egg collection and processing will be coordinated with USGS and USFW and will take advantage of existing permits held by USGS for the collection of eggs. Approximately ten bird eggs will be targeted for collection (six to eight nest sites within Portland Harbor with the remainder reference sites located upstream from Portland Harbor but below Willamette Falls). The work to be performed by the LWG would include egg collection and processing support and chemical analysis of the eggs. Egg tissues would be analyzed for selected chemicals including organochlorine pesticides, polychlorinated biphenyls (PCBs), chlorinated dibenzo-dioxins and furans, mercury and polybrominated diphenyl ethers (PBDEs).

In addition to the above items, EPA and the LWG have not resolved whether lamprey ammocoete tissue analysis is required as part of the water toxicity testing completed in January 2008. Discussion between the EPA and the LWG on this topic is ongoing.

As stated previously by EPA, the data collection needed to support the RI and risk assessment phase of the Portland Harbor RI/FS is essentially complete. Data needs currently being pursued are related to the Portland Harbor FS and the establishment of baseline conditions to support future long-term monitoring efforts. Although EPA does not anticipate any additional data collection to support the RI and baseline risk assessment at this time, the draft RI, baseline risk assessment and/or FS reports may identify additional data requirements that must be addressed to support remedial action decisions at the Portland Harbor site.

If you have any questions, please contact Chip Humphrey at (503) 326-2678 or Eric Blischke (503) 326-4006. All legal inquiries should be directed to Lori Cora at (206) 553-1115.

Sincerely,

Chip Humphrey
Eric Blischke
Remedial Project Managers

cc: Greg Ulirsch, ATSDR
Rob Neely, NOAA
Ted Buerger, US Fish and Wildlife Service
Preston Sleeger, Department of Interior
Jim Anderson, DEQ
Kurt Burkholder, Oregon DOJ
David Farrer, Oregon Environmental Health Assessment Program
Rick Keppler, Oregon Department of Fish and Wildlife
Michael Karnosh, Confederated Tribes of Grand Ronde
Tom Downey, Confederated Tribes of Siletz
Audie Huber, Confederated Tribes of Umatilla
Brian Cunninghame, Confederated Tribes of Warm Springs
Erin Madden, Nez Perce Tribe
Rose Longoria, Confederated Tribes of Yakama Nation

Table 1
Round 3 Data Gap Summary Table
March 24,2008

Data Needs	Round	LWG Proposed Samples	Additional 3B Data Needs Proposed by EPA	Notes and Current Status
Site Wide Data Needs				
Upstream Site Boundary	3A	8 sediment cores and 3 radioisotope cores	Contingent on results of Round 3A.	Sediment samples collected between RM 11 and 12.2 during Round 3B. No additional sampling anticipated.
Downstream Site Boundary	3A	12 grab samples and 7 sediment cores	Additional data collection unlikely.	Sediment samples collected between RM 1 and 2 during Round 3A. No additional sampling anticipated.
Riparian Soil	NA	None proposed	None - upland data gap.	No additional sampling anticipated.
Multnomah Channel	3B	10 sediment samples based on bathymetric survey results	General scope and scale of LWG proposal is acceptable.	Sediment samples collected during Round 3B; no additional sampling anticipated.
Non-AOPC Subsurface Sediments	3B	Contingent on additional data evaluation	10 - 12 sediment cores.	Sediment samples collected throughout study area during round 3B; no additional sampling anticipated.
Upstream - Background	3B	Approximately 20 sediment samples	General scope and scale is acceptable. Finalize sample numbers based on statistical analysis. Supplement with pulp mill site investigation data.	Sediment samples collected during Round 3B; no additional sampling anticipated.
Upstream Surface Water	3A	Transects at RM 16 and 11	Contingent on results of Round 3A and results of fate and transport modeling effort.	Surface water data collected during Round 3A; no additional sampling anticipated.
Upstream Biota	NA	None proposed	Upstream biota not required at this time.	No additional sampling anticipated.
HHRA				
Tissue chemistry	NA	None proposed	Biota tissue required to ensure adequate spatial coverage and full range of contaminant concentrations.	Tissue samples collected throughout study area during round 3B; no additional sampling anticipated.

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March 24,2008

Data Needs	Round	LWG Proposed Samples	Additional 3B Data Needs Proposed by EPA	Notes and Current Status
ERA				
Lamprey Ammocoete Tissue	3A	5 ammocoetes and 3 macrothalmia	Contingent on results of Round 3A.	Lamprey tissue collected during Round 3A; no additional sampling anticipated.
Lamprey Ammocoete Toxicity	3A	Range finding and definitive toxicity testing	Definitive toxicity testing proceeding as part of Round 3A.	Water toxicity testing completed; no additional testing anticipated.
Pre-Breeding Sturgeon	3A	15 individual fish	Additional data collection unlikely.	Sturgeon tissue collected during Round 3A; no additional sampling anticipated.
Tissue chemistry	3B	None Proposed	Biota tissue required to ensure adequate spatial coverage and full range of contaminant concentrations.	Tissue samples collected throughout study area during round 3B; no additional sampling anticipated.
Sediment Bioassays	3B	12 Bioassays in upper end of study area	44 bioassays recommended to support ERA.	55 bioassays collected during Round 3B; no additional sampling or testing anticipated.
TPH/PAH Evaluation for Bioavailability	3B	TBD	TBD	Alkylated PAHs included as Round 3B sediment analysis. Further evaluation of pyrogenic/petrogenic sources may be necessary; no additional sampling anticipated.
Bird Eggs	NA	TBD	TBD based on review of USGS osprey egg data.	**Analysis of bird eggs collected by USGS may be necessary as part of baseline monitoring program. Further disucussion required.**

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Round 3 Data Gap Summary Table
March 24,2008

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Fate and Transport Analysis				
Sediment Trap	3A	12 Sediment Trap locations	Additional data collection unlikely.	Four quarters of sediment trap samples collected during 2007; no additional sampling anticipated.
Stormwater Loading	3A	30 Stormwater sample locations	Additional data collection unlikely as part of Portland Harbor RI/FS. Additional sampling may be conducted as part of source control efforts.	Stormwater sampling completed in 2007 (water fraction). Solid fraction sampling currently underway.
Surface Water Loading	3A	23 Surface Water Samples	TBD based on results of hybrid fate and transport model.	Surface water data collected during Round 3A; no additional sampling anticipated.
TZW Loading	3B	None proposed	Additional data collection unlikely.	TZW sampling pefromed at GASCO. Stratigraphic coring performed offshore of Gunderson. Discsussions ongoing at RPAC. No additional sampling by LWG antiicipated.
Food Web Model				
Surface Water	3A	23 Surface Water Samples	Additional data collection unlikely.	Surface water data collected during Round 3A. No additional surface water data anticipated to support the food web model. See above note regarding the F&T Model.
Tissue chemistry	3B	None Proposed	Biota tissue required to support food web model or for enhanced understanding of bioaccumulative relationships.	Tissue samples collected throughout study area during round 3B; no additional sampling anticipated.

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Round 3 Data Gap Summary Table
March 24,2008

Data Needs	Round	LWG Proposed Samples	Additional 3B Data Needs Proposed by EPA	Notes and Current Status
Feasibility Study				
Treatability Studies	3B	TBD based on results of treatment technologies literature review	TBD	Based on our review of the literature survey for treatment technologies, EPA has determined that treatability studies are not required.
Debris Identification	3B	Side scan sonar on each AOPC	TBD	*Side scan sonar survey proposed by LWG. FSP is under review.*
Mobility Testing	3B	None proposed	Three mobility tests proposed.	*LWG proposal for mobility testing submitted. EPA has requested that LWG develop a mobility testing FSP.*
TPH/PAH Evaluation for Source ID	3B	TBD	TBD	Alkylated PAHs included as Round 3B sediment analysis. Further evaluation of pyrogenic/petrogenic sources may be necessary; no additional sampling anticipated.
Upstream Tissue Chemistry	NA	None proposed	Upstream biota not required at this time.	No additional sampling anticipated.
Site Wide AOPC				
Sediment chemistry	3B	None proposed	Additional sediment data to ensure adequate site coverage may be required.	Approximately 200 surface sediment samples collected through study area as part of Round 3B; no additional sampling anticipated.
Tissue chemistry	3B	None proposed	Additional tissue chemistry likely required to support food web model or for enhanced understanding of bioaccumulative relationships.	Tissue samples collected throughout study area during round 3B; no additional sampling anticipated.
Surface Water	NA	None proposed	Additional data collection unlikely.	Surface water data collected during Round 3A. No additional surface water data anticipated to support the site-wide AOPC. See above note regarding the F&T Model.
Transition Zone Water	3B	None proposed	Additional data collection unlikely.	TZW sampling pefromed at GASCO. Stratigraphic coring performed offshore of Gunderson. Discsussions ongoing at RPAC. No additional sampling by LWG antiicipated.

Table 1
Round 3 Data Gap Summary Table
March 24,2008

Data Needs	Round	LWG Proposed Samples	Additional 3B Data Needs Proposed by EPA	Notes and Current Status
AOPC Specific Data Needs				
Surface Sediment Chemistry	3B	49 surface grabs and 30 sediment cores (0 - 6" interval)	136 additional surface sediment samples required to ensure adequate spatial coverage.	Approximately 200 surface sediment samples collected as part of Round 3B; no additional sampling anticipated.
Subsurface Sediment Chemistry	3B	30 sediment cores	Additional subsurface sediment likely to determine vertical extent of contamination.	Approximately 100 subsurface sediment samples collected as part of Round 3B; no additional sampling anticipated.
Transition Zone Water	3B	None proposed	Additional TZW required at select facilities	TZW sampling pefromed at GASCO. Stratigraphic coring performed offshore of Gunderson. Discsussions ongoing at RPAC. No additional sampling by LWG antiicipated.
Groundwater Seeps	NA	None proposed	None - upland data gap.	No additional sampling anticipated.
Surface Sediment Toxicity	3B	12 bioassays proposed.	44 additional bioassays recommended to support ERA.	55 bioassays collected during Round 3B; no additional sampling or testing anticipated.

Notes:
Bolded Text: Unresolved. Further discussion required.
Italicized Text: FS data need. Plans for collecting data in 2008 are underway.

Appendix C

Description of GRID Model and Runoff Volume Calculations

1.0 Introduction

As discussed in Section 5.8 of the main body of this report, runoff volumes will be calculated using the City of Portland Bureau of Environmental Service's GRID model, for each segment of the river as shown in Figure C-1. The segments shown in Figure C-1 correspond to segments designated for the "Hybrid Model."

2.0 Delineation of River Segment Drainage Basins

Delineation of stormwater drainage to each river segment uses City MS4 delineation information, as well as other, non-City conveyance system information mapped in the City's GIS system. The runoff basins do not include docks. Runoff basins for each of the river segments are shown in Figure C-2.

3.0 Mapping of Impervious Areas

Differentiating between impervious and pervious areas is important because there is generally more runoff from impervious areas compared to pervious areas. The impervious areas were originally derived primarily from aerial imagery dating back to the mid-1990s, although adjustments have been made to this layer specific to the Portland Harbor effort by the City, particularly for the Unique Heavy Industrial sites. The City's Industrial Stormwater group also conducted limited quality assurance at other locations with the study area, based on their site knowledge. This original coverage is used exclusively and extensively for the City's sewer modeling, and as such, its suitability for other purposes is possibly limited, though it represents the best data available at this time. Impervious areas are shown overlaying the land use categories in Figure C-2.

4.0 Runoff from Representative Land Use Categories

Runoff volumes will be calculated separately for each land use category, since the data analysis will determine different chemical concentrations that are representative of each category. These land use categories, as discussed in Section 4.1 of the main body of this report are:

- Residential
- Major Transportation Corridors
- Heavy Industrial
- Light Industrial
- Parks and Open Space

These land use categories correspond to the City of Portland current zoning as shown below in Table C-1 and Figure C-2, with the exception of three modifications.

- The 28 zoning codes were aggregated to general land use groups for reporting of overall runoff from each group. Table C-1 shows how detailed zoning codes were aggregated, consistent with the *Stormwater Sampling Rationale* and the *Round 3A Stormwater Field Sampling Plan*.
- Major Transportation (highways and freeways), which is not in the City of Portland zoning, was added based on the Portland Office of Transportation's GIS layer showing highways to represent major Oregon Department of Transportation corridors.
- An additional adjustment was made to identify areas (designated as Open Space/Vacant on the map) that are currently identified in the zoning layer as something other than open space but where land use is more representative of open space, using Metro's 2005 Vacant Lands GIS layer. This occurs under several conditions:
    - Forested or vegetated areas that have never been developed (these occur primarily west of Highway 30).
    - Industrial lands that have been remediated, capped, and vegetated.

For industrial zoned areas, most of the polygons associated with zoned industrial areas that were identified as vacant in Metro's Vacant Land's layer were left designated as industrial because these are known historical industrial sites. Additionally, many of the representative industrial land use basins sampled as part of Round 3A and 3B stormwater sampling included some vacant land. Three subareas of zoned industrial land use sites were converted from zoned industrial land use to open space/vacant zoning use based on the areas being remediated and vegetated. These include:

- Gould Superfund site
- McCormick and Baxter Superfund site
- PGE Harborton wetlands (west of current facility)

Also, there were several other small areas that are zoned industrial but were changed to open space/vacant; these were forested areas that abutted Forest Park or vegetated areas that did not appear to have been historically used for industrial activities.

For non-industrially zoned properties, the vacant lands in Metro's layer were used to convert properties to open space/vacant in this new layer unless, using current aerials, it appeared that the property had been cleared and was being otherwise used for non-open space purposes (e.g., parking of vehicles, etc). In these cases, the land use zoning was left with its current designation.

Table C-1. Land Use Categories for Stormwater Loading Calculations.

General Land Use Code	Detailed Zoning Codes	Zoning Description[1]	Notes
IND (Heavy Industrial)	IH	Heavy Industrial	
LIND (Light Industrial)	IG2	General Industrial 2	
	EG1	General Employment 1	
	EG2	General Employment 2	
	EX	Central Employment	
	IG1	General Industrial 1	
TRANS (Major Transportation)	--	Not a zoned area.	This will be State Highways and Freeways derived as an overlay to the zoning layer
RES/COM (Residential and Commercial)	R10	Residential 10,000 sq. ft. lots	Sparse residential and commercial land use within Portland Harbor area but all zoning codes are included in case any of these are within the segment drainage areas.
	R7	Residential 7,000 sq. ft. lots	
	R5	Residential 5,000 sq. ft. lots	
	R3	Residential 3,000 sq. ft. lots	
	R2.5	Residential 2,500 sq. ft. lots	
	R2	Residential 2,000 sq. ft. lots	
	R1	Residential 1,000 sq. ft. lots	
	RX	Central Residential	
	RH	High Density Residential	
	IR	Institutional Residential	
	CG	General Commercial	
	CN1	Neighborhood Commercial 1	
	CN2	Neighborhood Commercial	
	CS	Storefront Commercial	
	CM	Mixed Commercial/Residential	
	CO1	Office Commercial 1	
	CX	Central Commercial	
	CO2	Office Commercial 2	
POS (Parks and Open Space)	OS	Open Space	Includes very low density residential located above Forest Park. This type of land use included in Open Space monitoring station. Also includes Vacant Land that is undeveloped and functions as Open Space.
	RF	Residential Farming	
	R20	Residential 20,000 sq. ft. lots	
	RUR	Rural (Mult Co. zoning code)	

[1]Portland Code Title 33 descriptions of land use zoning at http://www.portlandonline.com/auditor/index.cfm?c=28197

5.0 Runoff Volumes for Unique Heavy Industrial Sites

Calculation of runoff volumes for all Heavy Industrial sites will be reported separately, whether they were originally designated as unique or representative land use. The determination of whether a heavy industrial site is appropriately designated as Unique will be made as described in Sections 5.1 through 5.6 of the main report. Runoff volumes will be calculated separately for each location as listed in Table C-2. The classification or reclassification of unique heavy industrial locations will be conducted on a location-by-location and chemical-by-chemical basis. It should be noted that many of these locations may not be deemed Unique. However, because runoff volumes need to be calculated before the chemical data analyses are completed, runoff volumes will be calculated for every industrial location. If a location is deemed Unique, its runoff volume will be subtracted from the appropriate representative land use runoff volumes for each segment, so that loads can be calculated separately.

The particular approaches calculating and apply volumes and loads for various types of heavy industrial sites and basins sampled are detailed more in the following subsections.

5.1 INDIVIDUAL HEAVY INDUSTRIAL LOCATIONS SAMPLED BY LWG

Twelve Heavy Industrial locations, listed below in Section C-2, were sampled by LWG and may be deemed unique through the course of stormwater data analyses.

Table C-2. Heavy Industrial Locations.

Location ID	Description
WR-22	OSM
WR-123	Schnitzer International Slip
WR-384	Schnitzer – Riverside
WR-107	GASCO
WR-96	Arkema
WR-14	Chevron – Transportation
WR-161	Portland Shipyard
WR-4	Sulzer Pump
WR-145/142	Gunderson
WR-147	Gunderson (former Schnitzer)
Drains to OF-17	GE Decommissioning
WR-67	Siltronic
WR-218	UPRR Albina
St. Johns Bridge	Highway drainage

Many of the Unique locations have multiple outfalls and the LWG only monitored one or two of the site outfalls. It is proposed that for these locations, the loads from the sampled outfall will be extrapolated to the entire property. Therefore, runoff volumes will be calculated for the entire property for each Heavy Industrial location as shown in the attached Figures C-3a to h. It should be noted that applying loads measured from one outfall at a site to an entire industrial site is a necessary simplifying assumption for calculating loads from Unique Heavy Industrial sites. The assumption is that applying loads from one outfall to another outfall within the same industrial site will often be more accurate than using, for example, Representative Heavy Industrial loads. There may be particular sites where this is not the case, but it would be difficult to undertake a detailed analysis of each Unique Heavy Industrial site to determine whether particular subareas of the each site are more similar to either the remainder of the site or other generalized heavy industrial areas within the harbor. Such a simplification is fundamentally no different than the extrapolation of measured Representative Heavy Industrial area loads to other heavy industrial areas where runoff chemical concentrations were never measured. In both cases, a range of actual activities exist in the measure and extrapolated areas that are never identical across the two areas.

There are two locations where there are two outfalls sampled at the same industrial site. The loading for these sites is discussed below:

- Schnitzer WR-123 and WR-384
  - The WR-123 outfall drains through the Schnitzer location but does not drain any part of the Schnitzer-owned land. Therefore, unique loading from the WR-123 outfall will apply only to the WR-123 basin.
  - The WR-384 basin is representative of the site activity of the Schnitzer property and will be applied to the entire property ownership.
- Gunderson WR-142/145 and Gunderson (former Schnitzer) WR-147
  - While these two outfalls are both located on property owned by Gunderson and drain runoff from Gunderson property, the WR-147 outfall represents runoff from an area that had different historical industrial activities and therefore the basins are split at the former property ownership boundary just upstream of WR-142/145 as shown in the attached Figure C-3g. The loads from the WR-147 outfall will be extrapolated to include the former Schnitzer property and the loads from WR-142/145 outfall will be extrapolated to include the remainder of the property.

5.2 CITY OF PORTLAND INDUSTRIAL OUTFALLS

Some City of Portland outfalls sampled by LWG, which drain a larger portion of industrial area rather than a specific industrial site, could be classified as unique. In this case, if a basin is deemed unique, the runoff volumes and subsequent loads will be calculated separately for the particular basin. A list of these basins is shown below in Table C-3:

Table C-3. City of Portland Industrial Basins.

Location ID	Description
OF-22B	City - Doane Lk. Indus.
OF-M1, above Devine	City - Mocks Bottom
OF-M2	City - Mocks Bottom
OF-22	City – Willbridge Industrial
OF-16	City - Heavy Industrial

After the process of analyzing stormwater data is complete and the locations that are classified as Unique are determined, the runoff from each of these Unique locations will be subtracted from the general land use runoff volumes. This could include any of the entire basins listed in Table C-3, if they are deemed Unique.

5.3 UNIQUE HEAVY INDUSTRIAL LOCATIONS SAMPLED BY THE PORT OF PORTLAND

Six industrial locations sampled by the Port of Portland could also be deemed unique as part of the stormwater data analysis. These are listed below in Table C-4:

Table C-4. Port of Portland Industrial Basins.

Location ID	Description
OF-52C/Basin T	City - Terminal 4 Industrial
WR-183/Basin R	Terminal 4 - Slip 1
WR-181/Basin Q	Terminal 4 - Slip 1
WR-177/Basin M	Terminal 4 - Slip 1
WR-20/Basin L	Terminal 4 - Wheeler Bay
WR-169/Basin D	Terminal 4 (Toyota)

A February 26, 2007 memo from Ash Creek to the Port of Portland (Attachment C-1) discusses that many of the measured basins can be extrapolated to other Port of Portland basins. In the case that any of the above basins are deemed Unique, the loading from those basins will be applied to the other nearby basins as detailed in the attached memo and briefly summarized below. Details on why this extrapolation is appropriate, if these locations are deemed Unique, are discussed in the memo, which is attached for reference. See Figures C-3j for a visual representation of this information. A map of the Port basins is included in Attachment C-1.

- OF-52C/Basin T and WR-177/Basin M – No extrapolation to other basins recommended.

- WR-183/Basin R – Will be extrapolated to include Basin S and Basin N. Basin S may also be extrapolated from WR-181/Basin Q. Basin N may also be extrapolated from WR-20/Basin L. If both are deemed to be Unique, then further examination is needed to determine which basin is more representative or if results should be averaged.
- WR-181/Basin Q – Will be extrapolated to include Basin O and Basin S. Basin S may also be extrapolated from WR-183/Basin R. If both are deemed to be Unique, then further examination is needed to determine which basin is more representative or if results should be averaged.
- WR-20/Basin L – Will be extrapolated to include Basin J (PAHs only), Basin K, and Basin N. Basin N may also be extrapolated from WR-183/Basin R. If both are deemed to be Unique, then further examination is needed to determine which basin is more representative or if results should be averaged.
- WR-169/Basin D – Will be extrapolated to include Basin C.

5.4 GE DECOMMISSIONING FACILITY

The GE Decommissioning Facility was originally included in the Stormwater Sampling FSP, but during the project initiation, the Stormwater Technical Team recommended and EPA agreed that it would be sampled by the site owner instead of LWG. If this site is deemed Unique, the sampled outfall will be extrapolated to the entire property as shown in Figure C-3i.

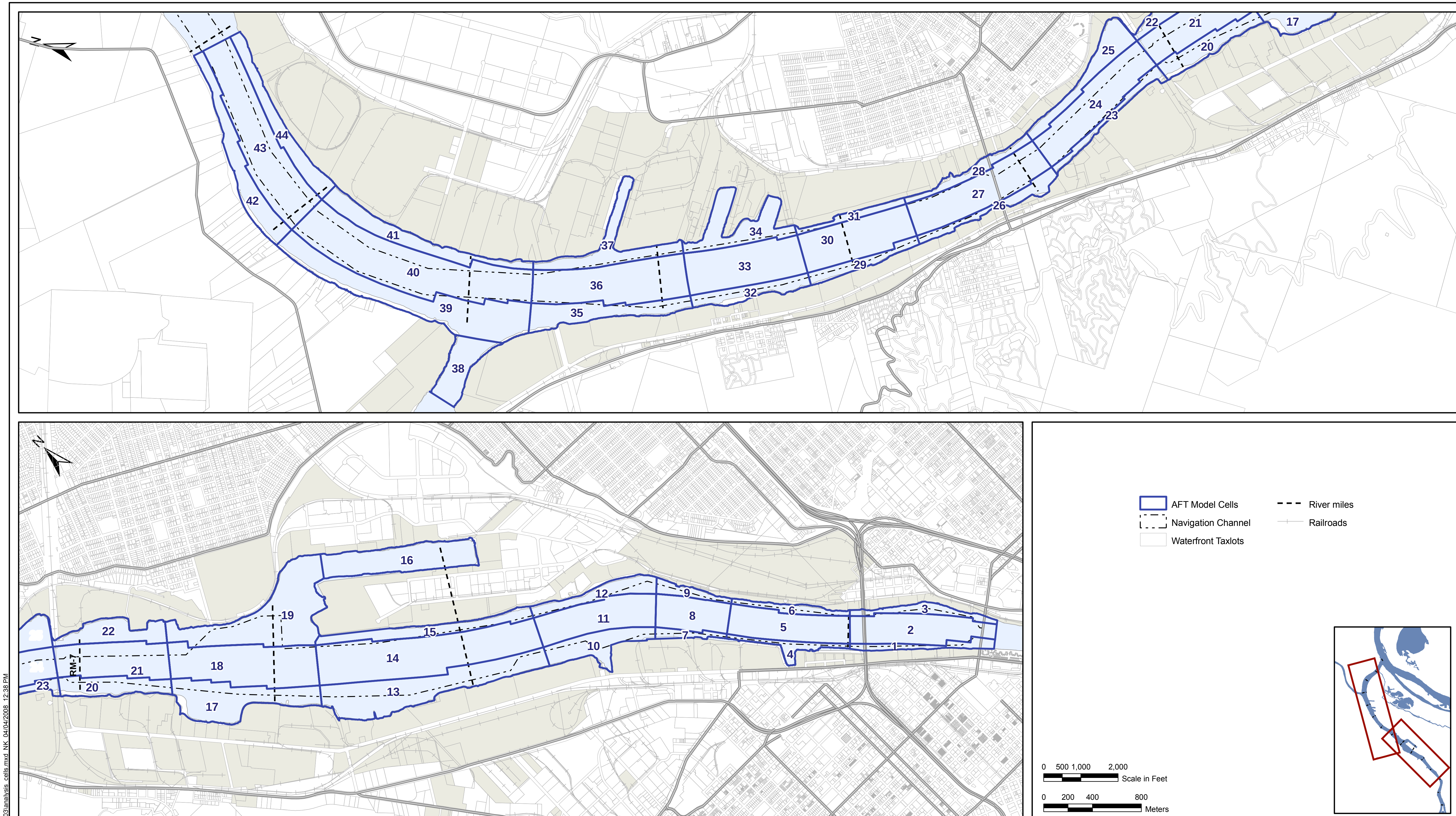

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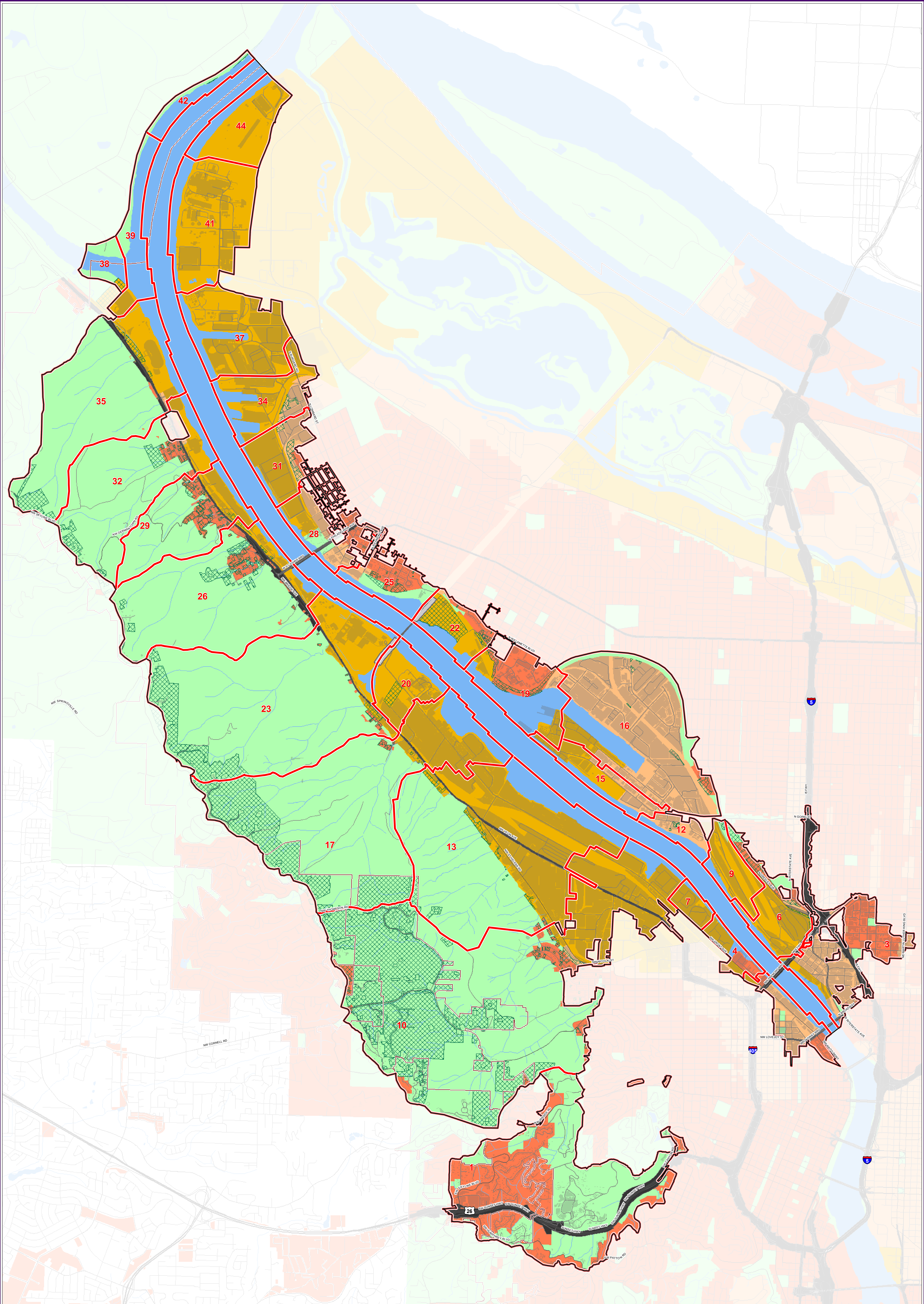
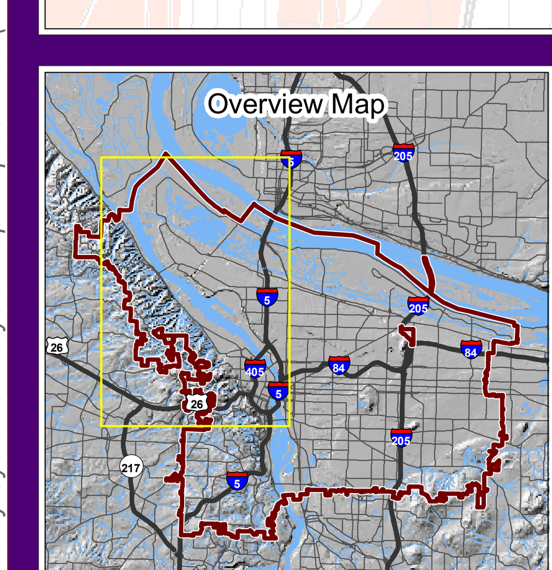
Figure C-1
Portland Harbor RI/FS
Stormwater Loading Calculation Methods
Hybrid Model Domain and Cells
River Mile 02 to 11





Legend

- City of Portland
- PH Hydroboundary
- Segment Basins
- Impervious Area
- Water Features
- Freeways
- Arterial Streets

PH Zoning Groups

- Heavy Industrial
- Light Industrial
- Parks and Open Spaces
- Residential/Commercial
- Major Transportation
- Open Space/Vacant Overlay

Lower Willamette Group - Analysis Layer Review Map

City of Portland Environmental Services
Systems Analysis
Spatial Analysis and Modeling

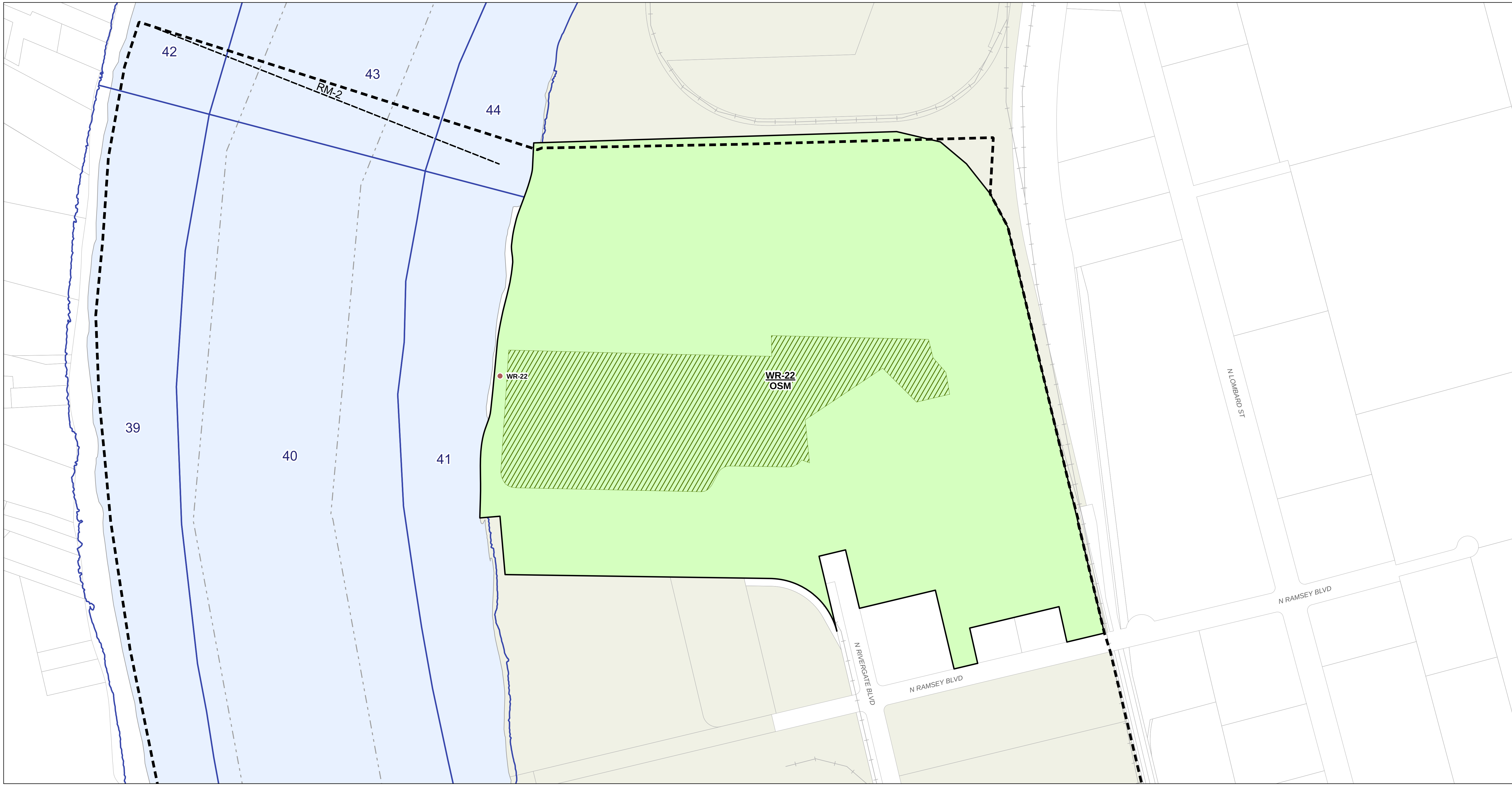
EVERY REASONABLE EFFORT HAS BEEN MADE TO ASSURE THE ACCURACY OF THE DATA ON THIS MAP. THE CITY OF PORTLAND MAKES NO WARRANTY, REPRESENTATION OR GUARANTEE AS TO THE ACCURACY OF THE DATA. THE CITY OF PORTLAND SHALL ASSUME NO LIABILITY FOR ANY ERRORS, OMISSIONS, OR INACCURACIES IN THE INFORMATION PROVIDED.

1 inch equals 2,000 feet

0 2,000 4,000 Feet

Sheet No.	Date Printed:
Figure C-2	05/02/08

Produced by Systems Analysis: Map Request 4665 (KDR) May 2nd, 2008 \\Cassio\Modeling\Projects\14552001_PortHarbor\LWG\GIS\MXD\LWG_Review_2.mxd



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Map Features:

2007 Stormwater Sampling Location

- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

0 100 200 300 400 500
Scale in Feet

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Figure C-3a
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-22

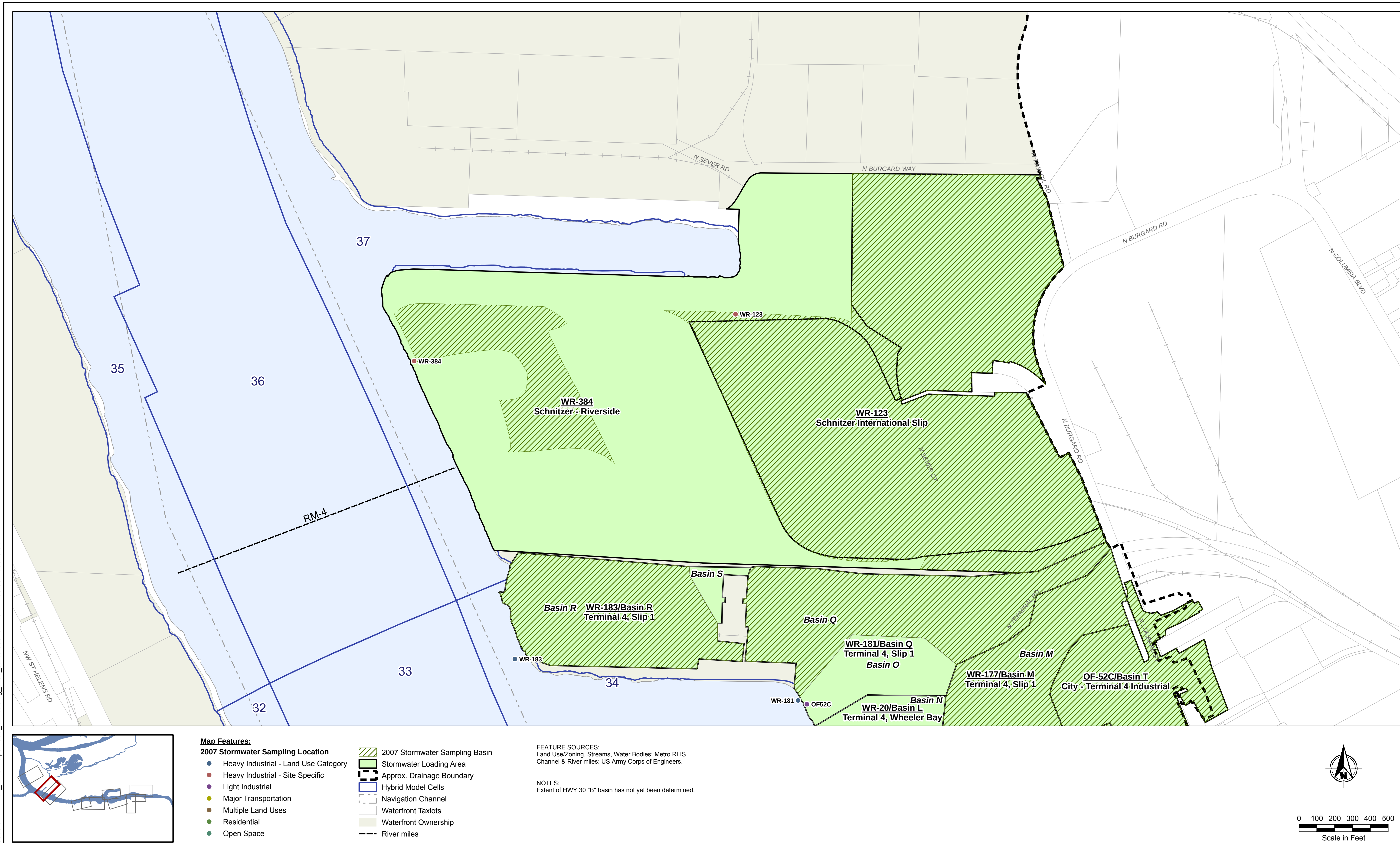

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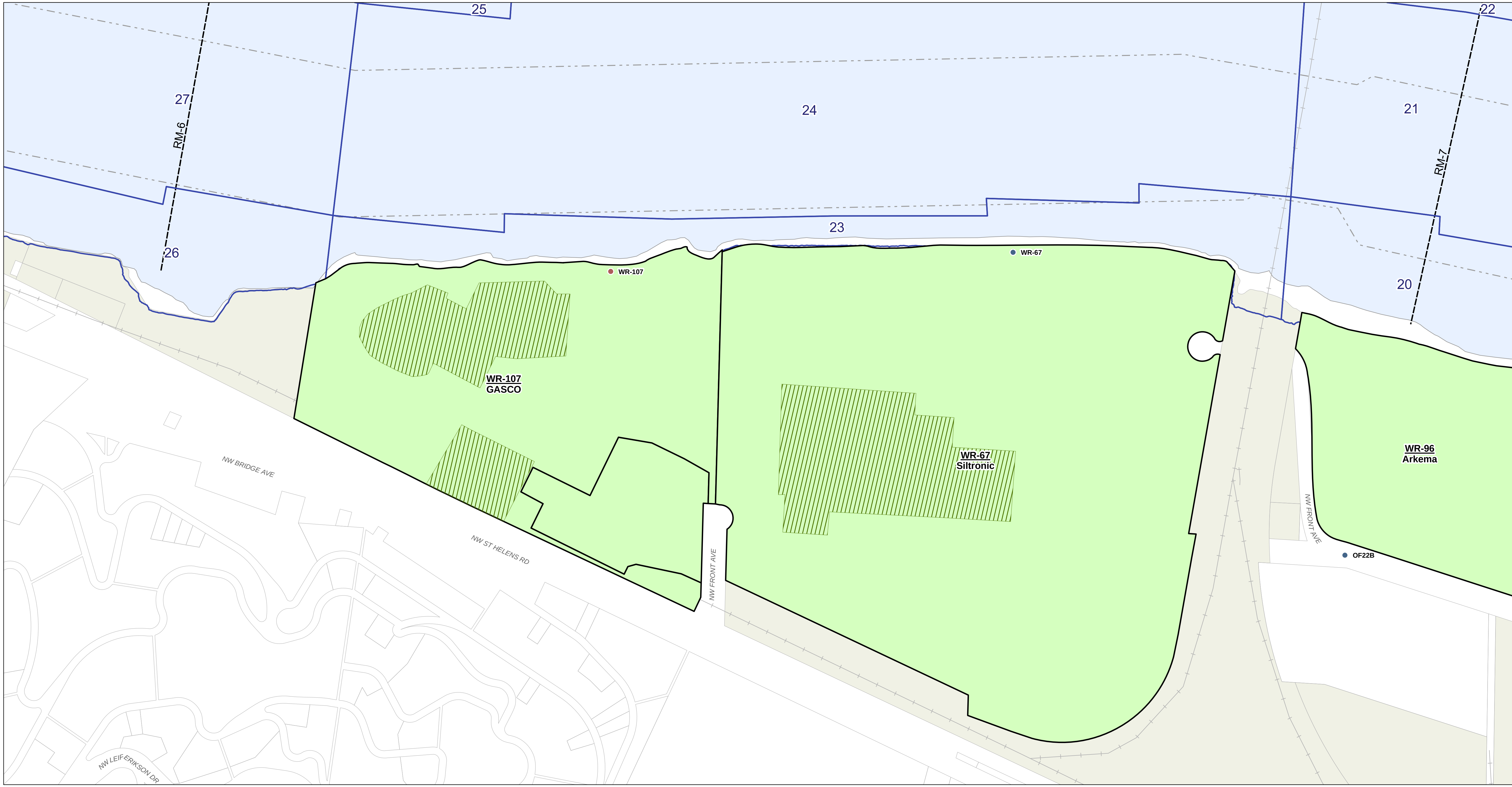
Figure C-3b
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-123, WR-384



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Map Features:

2007 Stormwater Sampling Location
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

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0 80 160 240 320 400
Scale in Feet

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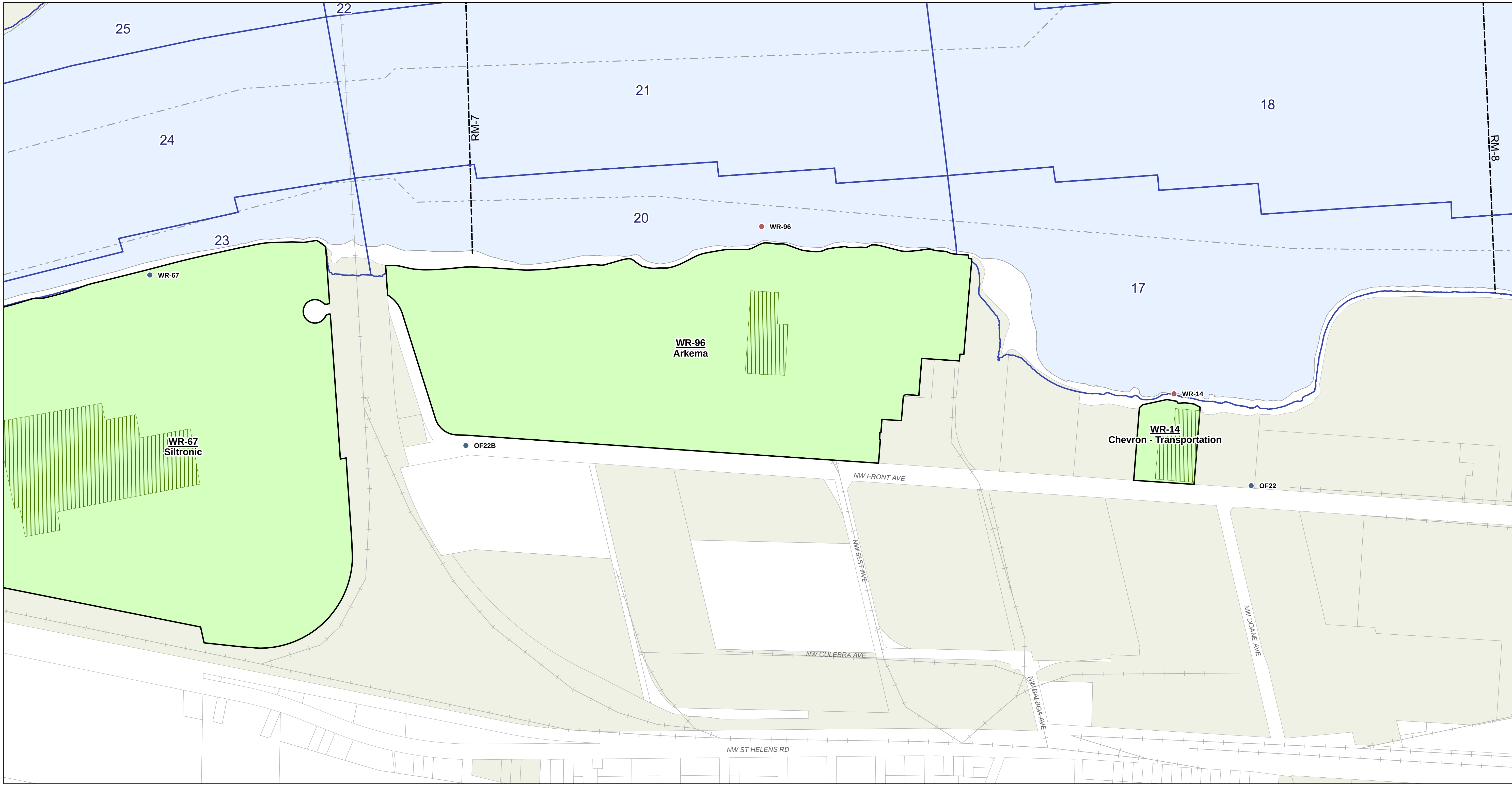
Figure C-3c
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-107, WR-67



Map Features:

2007 Stormwater Sampling Location
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

0 100 200 300 400 500
Scale in Feet

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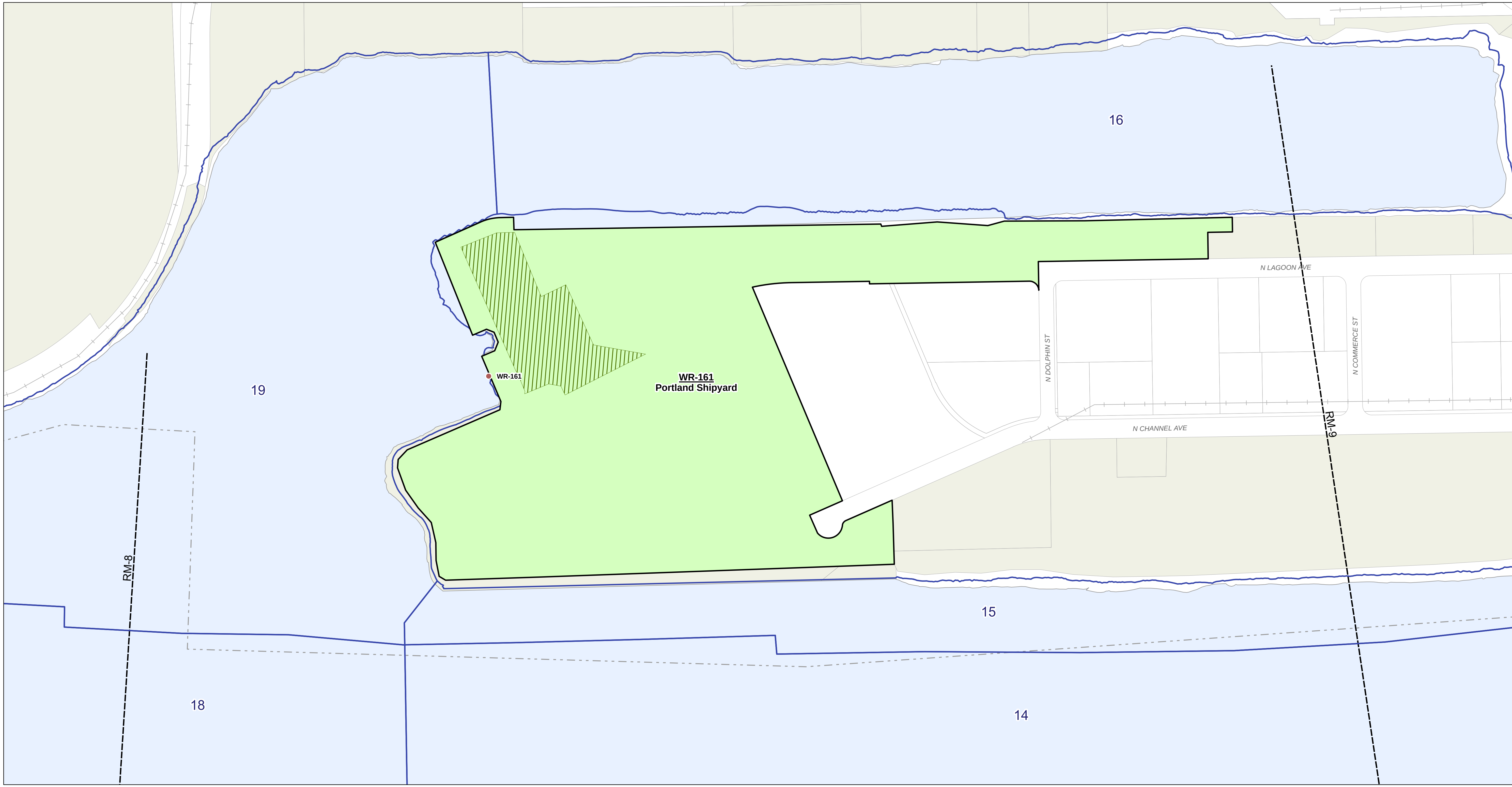
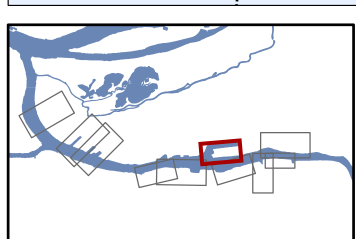
Figure C-3d
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-14, WR-96





Map Features:

2007 Stormwater Sampling Location
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

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Scale in Feet

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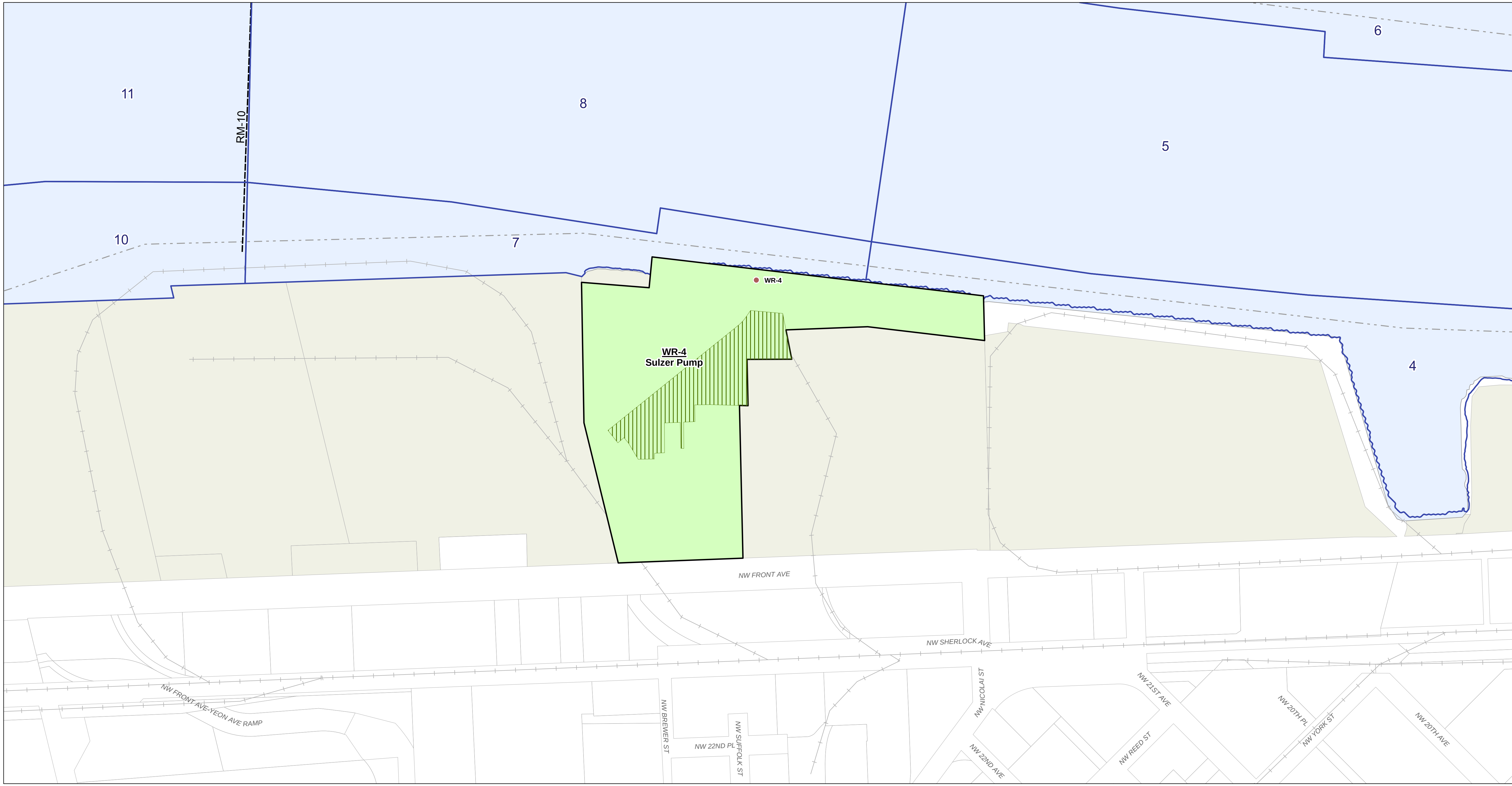
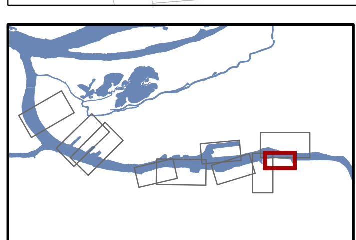
Figure C-3e
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-161





Map Features:

2007 Stormwater Sampling Location

- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

0 60 120 180 240 300
Scale in Feet

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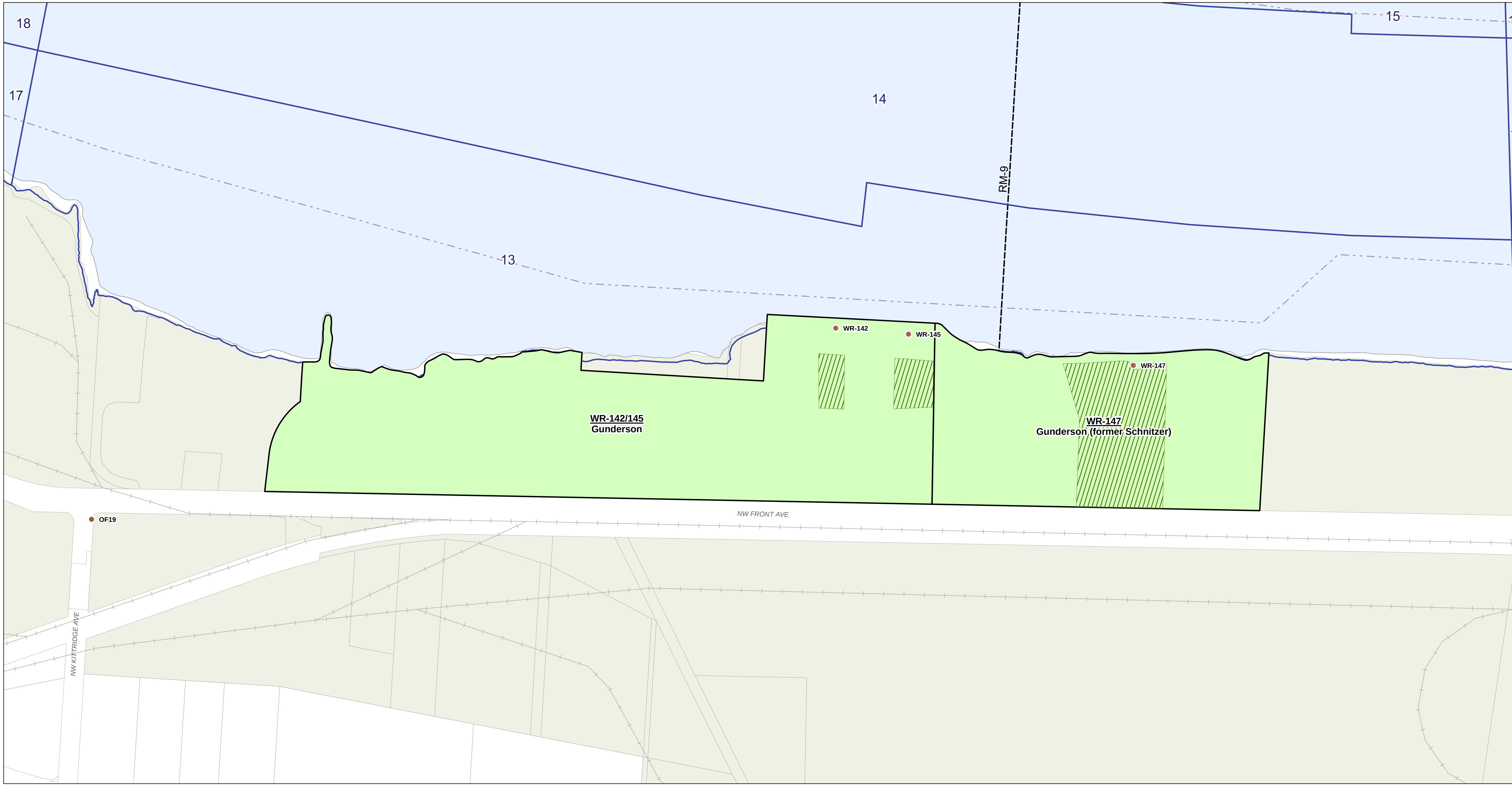
Figure C-3f
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-4



Map Features:

2007 Stormwater Sampling Location

- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

0 80 160 240 320 400
Scale in Feet

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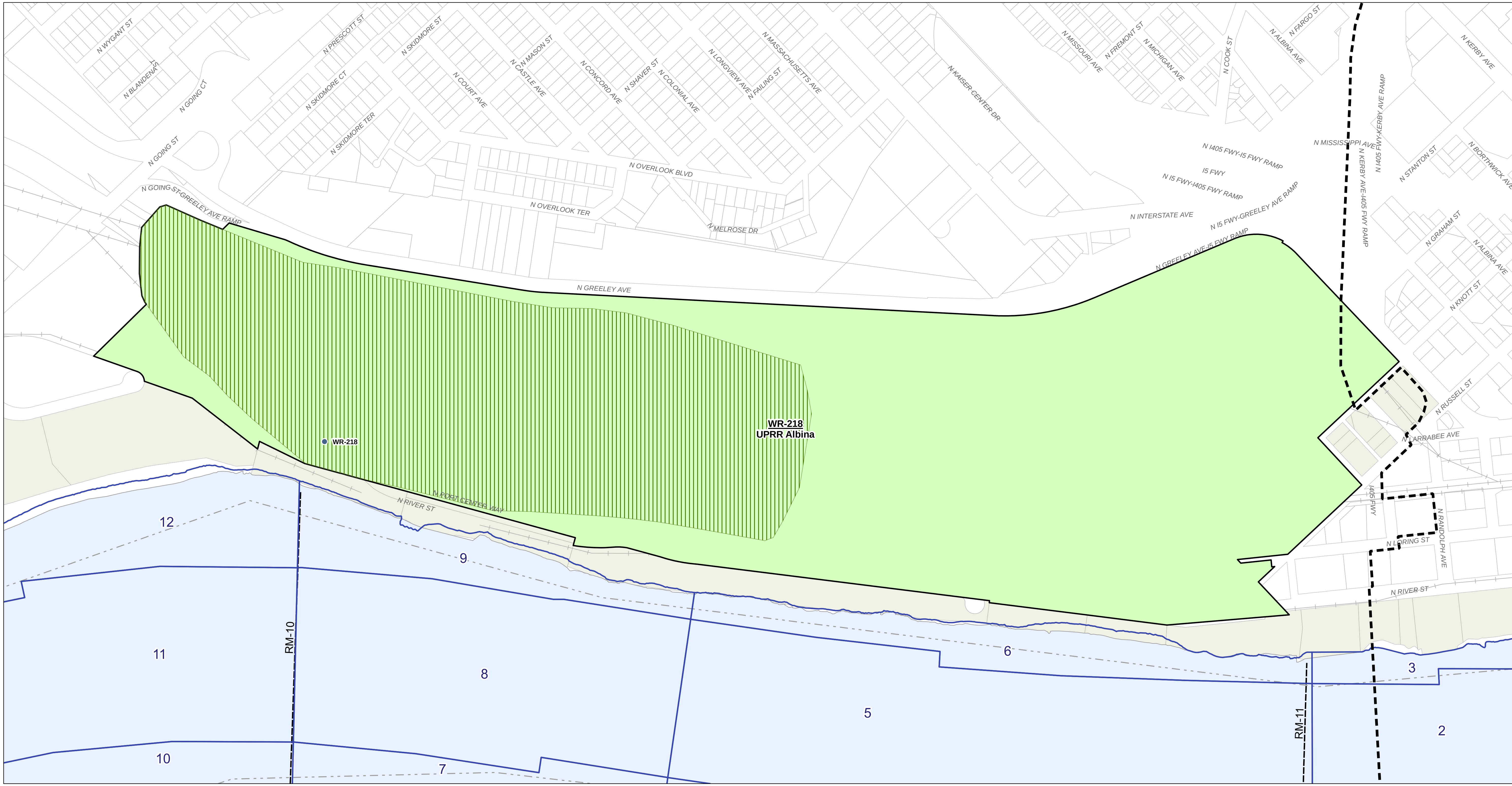
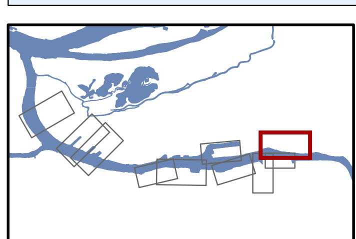
Figure C-3g
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-142/145, WR-147





Map Features:

2007 Stormwater Sampling Location

- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
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- Waterfront Ownership
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FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

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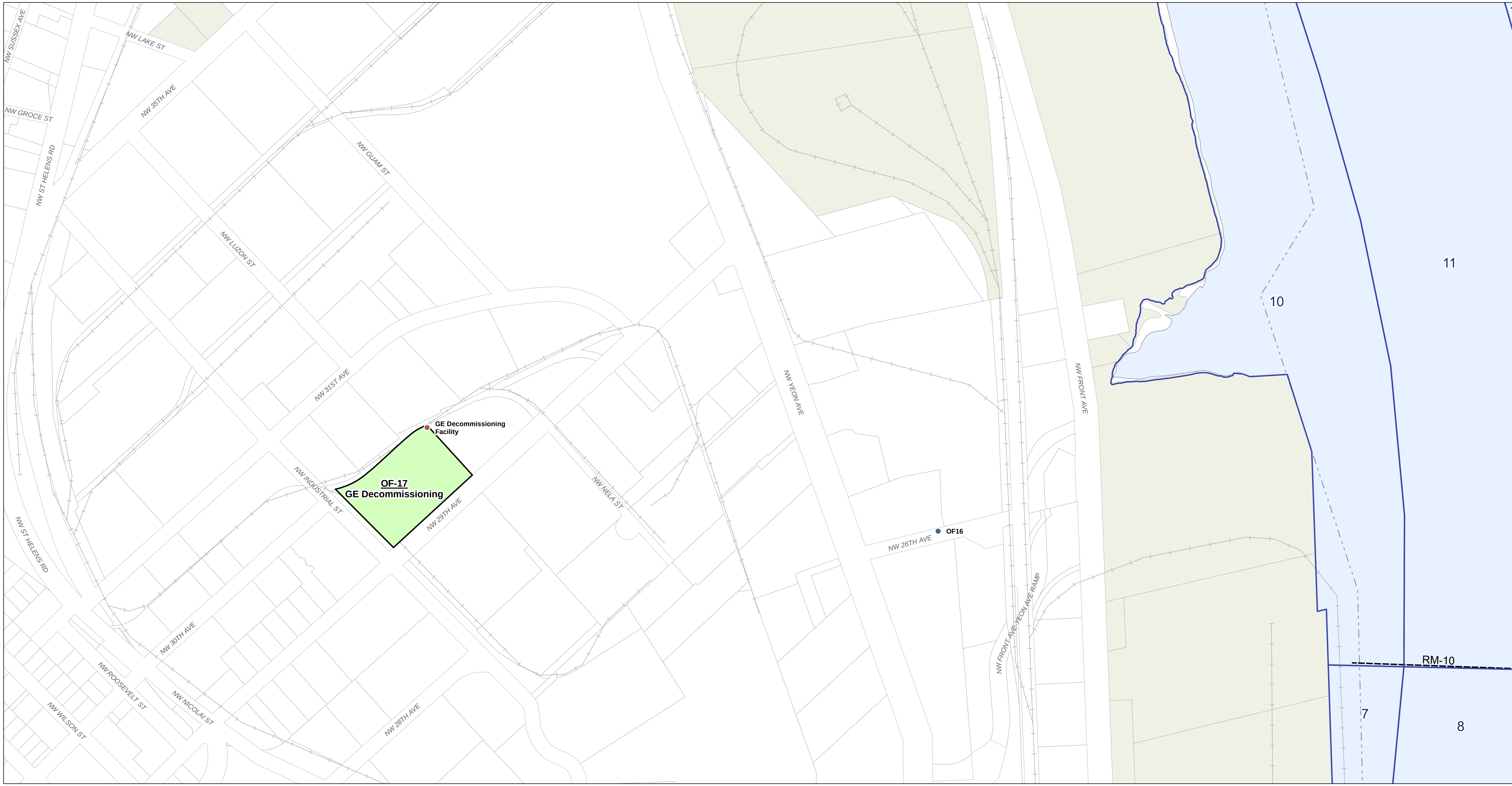
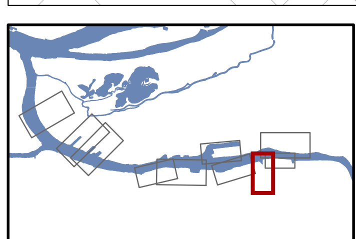
Figure C-3h
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
WR-218





Map Features:

2007 Stormwater Sampling Location
- Heavy Industrial - Land Use Category
- Heavy Industrial - Site Specific
- Light Industrial
- Major Transportation
- Multiple Land Uses
- Residential
- Open Space

- 2007 Stormwater Sampling Basin
- Stormwater Loading Area
- Approx. Drainage Boundary
- Hybrid Model Cells
- Navigation Channel
- Waterfront Taxlots
- Waterfront Ownership
- River miles

FEATURE SOURCES:
Land Use/Zoning, Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.

NOTES:
Extent of HWY 30 "B" basin has not yet been determined.

0 80 160 240 320 400
Scale in Feet

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ANCHOR ENVIRONMENTAL, L.L.C.
LWG Lower Willamette Group

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This document is currently under review by US EPA and its federal, state, and tribal parters and is subject to change in whole or in part.

Figure C-3i
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
OF-17

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Figure C-3j
Portland Harbor RI/FS
Stormwater and Sediment Trap Sampling Locations
Stormwater Loading Calculation Methods
Port of Portland Industrial Basins

Attachment C-1

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Memorandum

Date: February 26, 2007

To: Krista Koehl, Port of Portland
Nicole Anderson, Port of Portland

From: Amanda Spencer, Ash Creek Associates

cc: Andy Koulermos, Newfields

Re: Rationale for Basin Selection for Storm Water Sampling and
Additional Information Requested by Oregon Department of Environmental Quality (DEQ)
Portland, Oregon
ACA No. 1267

This memorandum provides the rationale for selecting basins for storm water solids and whole water sampling and basins for data extrapolation to support the recontamination analysis at Terminal 4 and complete the storm water source evaluation for Terminal 4 Slips1 and 3 Upland Facilities (Upland Facilities; Figure 1). Additional information on surface soil data and the storm water conveyance system requested by the DEQ in a meeting with the Port of Portland on January 9, 2007 has also been included and is described below, following the discussion of the rationale for storm water sampling locations.

Rationale for Basins Proposed for Sampling

The rationale for basin selection consisted of an evaluation of data needs for completion of the recontamination analysis, as well as data needs to complete the storm water evaluation for Slips 1 and 3. Protocols selected for collecting the storm water data consist of conducting both sediment trap sampling for solids analysis and automatic composite storm water samplers for whole water analysis, where access allows. The following provides the rationale for each of these data needs for each basin proposed for sampling. Figures 2 through 8 provide supporting information (Figure 2 summarizes detected constituents in surface soil; and Figures 3 through 8 list the detected constituent concentrations for metals, total polycyclic aromatic hydrocarbons [PAHs], polychlorinated biphenyls [PCBs], pesticides, semivolatile organic compounds [SVOCs; except PAHs], and total petroleum hydrocarbons [TPH], respectively). Tables 1A through 1C list the PAH concentrations detected in surface soil at the Upland Facilities.

Basin D – Basin D was sampled using a sediment trap during the initial deployment. Sufficient sample was recovered to complete analyses for PCBs and pesticides. Basin D is one of the larger basins at Terminal 4 Slips 1 and 3 (17 acres, or 15 percent of the total drained area) and it currently has a unique usage for the Slip 1 and Slip 3

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Upland areas, being used primarily for automobile storage on a paved parking area. Historically, the area was used primarily for petroleum-related activities (e.g., the subsurface Union Pacific Railroad [UPRR] petroleum pipelines and Quaker State above-ground tanks for motor oil storage).

- Storm Water Evaluation Data Needs: Review of historical activities indicates the possibility of TPH or PAHs in surface soil (Hart Crowser, 2000). Remedial Investigation (RI) data did not indicate the presence of TPH in surface soils (releases appear to have been subsurface), but low concentrations of PAHs were detected (see Figures 2 and 3 and Table 1, attached). Phthalates have been identified by the DEQ as a potential storm water contaminant that could be present at all sites due to its ubiquitous nature. Therefore, to address storm water source evaluation data needs, additional storm water sampling and analysis for PAHs, TPH, and phthalates is proposed.
- Recontamination Analysis Data Needs: Sediment samples collected in 2006 demonstrated elevated levels of PAHs and low levels of lead and zinc downstream of Berth 414, which is currently being evaluated for an in-water cap. Therefore, to address potential recontamination analyses data needs, additional storm water data on metals and PAHs are proposed.

Basin D was selected for additional sampling because of its large size (relative to other basins at Slips 1 and 3), unique historical and current usages (relative to other basins in Slips 1 and 3), and the presence of chemicals of potential concern (COPCs) in sediments downstream of its outfall location. The manhole identified for deployment of the sediment trap sampler and installation of the composite storm water sampler is located downgradient of a Downstream Defender installed as a part of system upgrades during the development of this area for additional new Toyota automobile storage in 2004. The manhole was inspected on November 28, 2006, and sufficient access and space is available for the installation of both the sediment traps and a composite storm water sampler.

Basin L – This basin was sampled during the initial deployment for the recontamination analysis and sufficient solids were obtained for analysis for metals, PAHs, PCBs, pesticides, and total organic carbon (TOC). The conveyance system in this basin was recently reconfigured as a part of the railway expansion project at Terminal 4 Slip 1, reducing the drainage basin to 17.2 acres (from an original 30 acres). Basin L is still one of the larger drainage basins at Terminal 4 Slips 1 and 3, comprising 16 percent of the total drained area. Basin L is a sensitive basin for recontamination because it discharges into Wheeler Bay, an area that will be capped during the Terminal 4 Early Action.

- Storm Water Evaluation: Historical activities in basin L included warehousing, and the rail and ship import and export of materials, including soda ash and pencil pitch (Hart Crowser, 2005). Results of a site reconnaissance indicated the potential presence of pencil pitch fragments along the rail tracks. Results of surface soil sampling conducted in potential source areas (including along the rail lines) indicated the presence of detectable concentrations of PAHs, PCBs, metals, and pesticides (Figure 2).
- Recontamination Analysis: Basin L discharges to Wheeler Bay where sediment samples contained elevated concentrations of PAHs and lower levels of lead, zinc, dichloro-diphenyl-trichloroethane (DDT) and PCBs.

Basin L was selected for additional sampling due to its significant percentage of the overall drained area at Slips 1 and 3; the fact that it drains to Wheeler Bay, an area being capped during the Early Action; and the detected compounds in sediments in Wheeler Bay and in surface soil. Both the storm water and recontamination data needs include sampling and analysis for PAHs, PCBs, metals (including lead and zinc), and pesticides (primarily DDT compounds). Based on site reconnaissance conducted on October 18, 2006, adequate access is available for both in-line sediment trap sampling and an automatic composite sampler, and both are proposed for this basin.

Basin M – This basin was not initially selected for sampling during the 2004/2005 deployment because a large portion of the basin is unpaved and the surface water infiltrates. However, the conveyance system in this basin was reconfigured as a part of the recent railway expansion, and a treatment unit was installed at the downstream end. This reconfiguring included enlarging the drainage area by acquisition of a portion of the adjacent basin L, increasing the basin size to 29.1 acres. Basin M is now the largest basin at Terminal 4 Slips 1 and 3, comprising 26 percent of the drained area. The drainage from this basin currently discharges to Slip 1, but will be reconfigured as part of the Early Action confined disposal facility (CDF). Therefore, an understanding of the storm water load in this conveyance system is needed.

- Storm Water Evaluation: Historical activities in basin M included vehicle parking, equipment storage, and rail import and export of materials, including soda ash and pencil pitch (HartCrowser, 2004). Results of a site reconnaissance indicated the potential presence of pencil pitch fragments along the rail tracks. Results of surface soil sampling conducted in potential source areas (including along the rail lines) indicated the presence of detectable concentrations of PAHs, PCBs, metals (arsenic, cadmium, copper, nickel, lead, mercury, and zinc), and pesticides (Figure 2).
- Recontamination Analysis: Basin M discharges to Slip 1, where sediment samples contained elevated concentrations of PAHs and metals (primarily cadmium, copper, nickel, lead, and zinc), and detections of PCBs and DDT compounds. A treatment system has been installed in the conveyance line for the reconfigured basin M that treats the storm water flow for soluble metals and oil and grease.

Basin M was selected for additional sampling due to its significant percentage of the overall drained area at Slips 1 and 3; its recent reconfiguration to drain a larger area of Slip 1; and its sensitivity for the Early Action recontamination analysis due to the future plan to drain this basin to the river just upstream of the CDF and an area designated by the Early Action for monitored natural recovery (MNR). Both the storm water and recontamination data needs include sampling and analysis for PAHs, PCBs, metals (including lead and zinc), and pesticides (primarily DDT compounds). Based on the October 18, 2006 site reconnaissance, a manhole is present directly downgradient of the treatment unit. Adequate access is available within the manhole for both in-line sediment trap sampling and an automatic composite sampler, and both are proposed for this basin.

Basin Q – This basin was sampled using an in-line sediment trap during the previous storm water sampling deployment. In addition, a grab bulk storm water sample was collected for total suspended solids (TSS) analysis. However, the manhole accessed for the sediment trap installation is upstream of more than 50 percent of the catch basins on this conveyance line. Basin Q is approximately 18 acres, comprising 16 percent of the drained area of Terminal 4 Slips 1 and 3. The outfall for this basin currently is located at the head of Slip 1; however, the conveyance line will be reconfigured to discharge to the river as part of construction of the Early Action CDF.

- Storm Water Evaluation: Historical activities in basin Q consisted of grain storage and associated rail and ground support activities (HartCrowser, 2004). A number of potential source areas were identified and sampled during the RI process. Results of surface soil sampling conducted in potential source areas indicated the presence of detectable concentrations of PAHs, PCBs, pesticides, and metals (chromium, lead, mercury, and zinc; Figure 2).

- Recontamination Analysis: Basin Q discharges to Slip 1 where sediment samples contained elevated concentrations of PAHs and metals (primarily cadmium, copper, nickel, lead, and zinc), and detections of PCBs and DDT compounds.

Basin Q was selected for additional storm water sampling due to its relative size (16 percent of the total drained area of Slips 1 and 3); its unique usage (grain storage with associated support activities); the similarity between detected compounds in surface soil and sediments; and the sensitivity of recontamination because the reconfigured system will drain to Berth 401, an area designated for monitored natural recovery and a small in-water cap as part of the Early Action.

This basin was inspected during the October 18, 2006 reconnaissance to determine if a manhole was present further down the line from the original sediment trap sampling location; and it was confirmed that there is not a manhole further down the conveyance line. However, it is possible to drill down to the line for the installation of a composite storm water sampler and this can be completed in a location downstream of most of the catch basins on the line. Therefore, storm water sampling will be conducted at basin Q via an automatic composite sampler. Further sediment trap sampling is not proposed at this basin because: (1) the sediment trap sampler deployed during the initial deployment period captured sufficient volume to allow for the analysis of the complete set of contaminants of interest (COIs) for this basin (PAHs, metals, PCBs, phthalates, pesticides); (2) if the outfall is submerged (as is the case for this basin), a manhole is needed for the deployment of a sediment trap sampler and a manhole further downstream of the initial sample location is not present; and (3) the collection and analysis of the composite storm water samples will allow sufficient data to assess the contribution from the parts of the system not sampled by the sediment trap to complete the evaluation of mass loading and assess storm water as a potential upland source to the river.

Basin R – Basin R was not sampled during the initial deployment. The basin is approximately 15 acres, comprising 14 percent of the drained area of Slips 1 and 3. This basin discharges upstream of the Berth 401 monitored natural recovery and in-water cap area discussed above.

- Storm Water Evaluation: Historical activities in basin R consisted of ancillary activities to support grain import, export, and storage (HartCrowser, 2004). A number of potential source areas were identified and sampled during the RI process. Results of surface soil sampling conducted in potential source areas indicated the presence of elevated PAHs near the rail lines (which is also near the catch basins for the conveyance line) and detectable concentrations of PAHs, PCBs, pesticides, and metals in other areas of the basin (Figure 2).
- Recontamination Analysis: Basin R discharges upstream of Berth 401 where sediment samples contained PAHs and metals (primarily copper, nickel, and zinc), PCBs, and DDT compounds. An elevated PCB level was also detected in sediment adjacent to this basin.

Basin R was selected for sampling primarily due to the elevated PAHs in surface soil near the conveyance line and additionally because the basin discharges directly upstream of Berth 401 where the Early Action calls for a small sediment cap and monitored natural recovery. The conveyance line was inspected on October 18, 2006, and it was determined that adequate access for both in-line sediment trap sampling and an automatic composite sampler is available. Both sampling methods will be conducted.

Basin T (City of Portland Outfall 52C) – This outfall drains to Slip 1 and additional data is needed to support the recontamination analysis. The farthest downstream manhole was inspected on October 18, 2006, and it was determined that there is adequate access for both an in-line sediment trap sampler and an automatic composite sampler. Both are proposed for this basin to provide a comparison of data with the initial deployment and to assess the additional information provided by the bulk stormwater sampling. An access agreement between the Port and the City has been completed to allow this work to proceed.

City of Portland Outfall 53 – Data is needed from this conveyance line to complete the recontamination analysis as it discharges directly upstream of the Early Action area. An in-water sediment trap sampler was placed near this outfall in the 2004/2005 deployment period. However, the sampler deployed near this outfall was tipped over and no sample was obtained. Therefore, sediment trap and automatic composite storm water samplers will be deployed within the conveyance line to evaluate its contribution to the system. An access agreement between the Port and the City has been completed to allow this work to proceed.

Basins Proposed for Data Extrapolation

As a part of the scoping of the storm water sampling program to meet the source evaluation and recontamination needs, data available for all of the basins were reviewed. Some of the basins were selected (as described above) and some of the basins were determined not appropriate or not necessary for sampling to complete the objectives of the storm water source control evaluation and recontamination analysis. The rationale for the basins selected for data extrapolation is provided below.

Basin C – Sampling of basin C was evaluated to determine data needs for completing the recontamination analysis.

- Recontamination Analysis: Basin C was sampled for solids as part of the 2004/2005 deployment, and the collected solid samples were analyzed for PAHs, metals, phthalates, PCBs, and pesticides (Blasland, Bouck & Lee [BBL], 2005c). Bulk storm water sampling for TSS data was not completed during the 2004/2005 sampling program. As detailed above, storm water and solids from basin D are being sampled. Because the land use and storm water management systems of basins C and D are almost identical, the additional information obtained from basin D during the 2006/2007 deployment can be readily extrapolated to basin C to complete the recontamination analysis of potential upstream contributions from basin C to the Early Action area.

Basin J – Basin J is approximately 2.6 acres, comprising just 2 percent of the total drained area of Slips 1 and 3. The basin outfall drains to the head of Slip 3. Basin J consists of the Gearlocker building and a surrounding unpaved, graveled yard area. With the exception of one catch basin, the drainage to this basin is primarily from roof drains of the Gearlocker building and most of the surface water in this basin infiltrates.

- Storm Water Evaluation and Recontamination Analysis: Historically, land use in basin J consisted of the Quaker State facility. Results of the Terminal 4 Slip 3 RI found a limited area of PAH concentrations (primarily benzo-a-pyrene) that exceeded risk-based human health screening levels for occupational use. The PAHs appear to be limited to the former Quaker State Tank Farm area and the source of the PAHs appears to be associated with the former activities in the Quaker State area (Ash Creek, 2004). Given the presence of pencil pitch observed along the tracks in basins M and L, there is a higher likelihood of PAHs in storm water from these areas than in basin J. Furthermore, site reconnaissance indicates that the area containing the one catch basin not related to the roof drains does not drain the former Quaker State Tank

Farm area. Finally, the area drained by the one catch basin is extremely limited and represents only a small fraction of the overall area drained at Slips 1 and 3.

Basin J was not selected for sampling due to its small size, limited drained area, and the construction of the basin such that surface water predominantly infiltrates into the subsurface through the basin's graveled surface. PAHs are the only constituent of potential concern in basin J, and the PAH results from basin L can conservatively be extrapolated to basin J for the source control and mass loading evaluations.

Basin K – Basin K is approximately 1.5 acres, comprising just 1 percent of the total drained area of Slips 1 and 3. The basin consists of two catch basins and an outfall draining to the head of Slip 3. Based on land use, the basin can be considered a sub-area of basin L, being comprised of identical usage (part trackage and part Kinder Morgan operational facility).

- Storm Water Evaluation and Recontamination Analysis: As identified above, historical and current land use in basin K is identical to basin L. Given the same usage, the surface soil is expected to contain the same COPCs as identified in basin L (PAHs, PCBs, pesticides, and metals), and at the same levels.

Basin K was not selected for sampling due to its small size, limited drained area, and identical current and historical land use with basin L. Results from basin L can be extrapolated to basin K for both the source control and mass loading evaluations.

Basin N – Basin N is approximately 3.5 acres, comprising just 3 percent of the total drained area of Slips 1 and 3. The basin currently drains to the head of Slip 1 but will be reconfigured to discharge to the river as part of construction of the CDF. Basin N was originally selected for sampling for the 2005 deployment (BBL, 2005b); however, a field reconnaissance by BBL on January 12, 2005, determined that land use was similar to larger basins that drain to the same sub-area, and the basin was not sampled during the 2005 deployment.

- Storm Water Evaluation: This basin drains a graveled area to the west of the Rogers Terminal and Shipping facility. International Raw Materials (IRM) is south of basin N and little runoff from IRM appears able to drain to this basin. Only a small portion of a graveled roadway used by IRM appears to have the potential to drain to one catch basin of basin N. The IRM facility is primarily unpaved and surface water at IRM appears to infiltrate. Potential source areas in basin N were identified and sampled as a part of the RI. Results of surface soil analysis indicated detections of PAHs and metals. Elevated concentrations of lead were detected in one localized area during the RI and this basin was reconsidered for sampling based on the lead results. However, site reconnaissance on October 18, 2006, demonstrated that storm water from the surface soil area containing lead would not flow to the basin N catch basin/conveyance system. The detected concentrations of PAHs and metals outside of the localized lead area are similar to or lower than those found in other basins being sampled (e.g., basins R, Q, M, and L; see Figures 3 and 4 and Table 1, attached). Current use of basin N is limited primarily to surface vehicle traffic and rail spurs, similar to current uses in basins O, L, and R.
- Recontamination Analysis: As identified above, the current use of basin N is limited to primarily surface vehicle traffic and rail spurs, similar to current uses in basins O, L, and R.

Due to the small basin size and similar uses to other basins, sampling at this basin is not proposed. Data collected at basins L and R in the upcoming deployment, and from O during the initial deployment, can be used to evaluate the potential adverse effects of storm water sources in basin N. This will provide a conservative assessment of storm water source and recontamination potential, because the land use within basin N, while similar, is more limited than the above basins. Additionally, the COPC concentrations in surface soil in potential source areas identified during the RI are similar to or lower than concentrations in the other basins (see Figures 3 through 7, attached).

Basin O – Basin O is approximately 5.5 acres, comprising just 5 percent of the drained area of Slips 1 and 3. This basin was sampled during the initial deployment and the samples were analyzed for the presence of metals due to the presence of a temporary soil stockpile in the area.

- Storm Water Evaluation: Historical land uses in basin O were limited, and only two potential source areas were identified during the RI proposal process that required further assessment. These uses (ancillary areas to the grain storage silos and the possible presence of a disposal area of creosoted wood) were the same as identified in basin Q. Surface soil sample results indicated the presence of low concentrations of metals, PAHs, and pesticides in the waste-wood area, and low concentrations of PCBs in the grain storage area. These detections were similar in magnitude and composition to surface soil sampling results from similar source areas identified in basin Q (see Figures 3 through 7). No other source areas that could have impacted surface soil were identified in the DEQ-approved RI Work Plan.
- Recontamination Analysis: Plans to remove the temporary stockpile are underway at the Port. Uses of basin O are limited to some vehicular traffic for trucks or cars traveling to and from basins L and M and the UPRR railroad tracks on the north side of the basin.

This basin was not selected for additional sampling due to its small size, limited current and historical land use, lack of surface sources, and similarity in surface soil sampling results to basin Q. Results from basin Q can be extrapolated to basin O to assess for potential storm water source issues and recontamination analysis.

Basin S – Basin S is approximately 1 acre and comprises less than 1 percent of the drained area of Slips 1 and 3. This basin was not selected for sampling in the 2005 deployment due to its small size.

- Storm Water and Recontamination Analysis Evaluation: Historical land use in basins R, S, and Q comprised the former grain import, export, and storage operation at Slip 1. The area is primarily vacant at this time. No potential surface soil sources were identified in the basin S area in the DEQ-approved RI work plan for Terminal 4 Slip 1 Upland Facility, and no surface soil sampling was conducted in this area. The basin is predominantly paved.

Due to its small size, lack of surface sources, and similar land use to basins Q and R, basin S was not selected for sampling. Storm water sampling results from basins Q and R can be extrapolated to basin S to conservatively assess potential source control and recontamination analysis elements.

Finally, to assist in both the recontamination evaluation and the storm water characterization program, Ash Creek plans to walk the Terminal 4 Upland Facility during a significant rain event (e.g., an event with more than 1/2 inch of rain in a 24-hour period, if possible,) to physically observe and document areas of overland flow and infiltration. Specifically, areas adjacent to river and slip banks will be evaluated to assess the potential for overland flow to the banks from the facility. Similarly, catch basins within each drainage basin will be observed to better estimate the aerial extent of drained area and document areas of infiltration.

Additionally Requested Information

The DEQ has requested information to assist in its evaluation of storm water in accordance with the Joint Source Control Strategy (JSCS) guidance document (DEQ, 2006). Specifically, the DEQ requested:

1. A site plan showing paved and unpaved areas in relation to the storm water conveyance system (including catch basins) and surface soil sampling locations. Figure 9, attached, shows each of these elements.

2. Screening of analytical results for surface soil samples collected within 100 feet of existing catch basins against DEQ JSCS toxicity and bioaccumulative sediment screening levels. Figure 10 provides a summary of this information and identifies surface soil sampling locations within 100 feet that have concentrations of COI that exceed either the JSCS toxicity or bioaccumulative screening level values for sediment. Figure 11 shows the locations of surface soil samples where detected COI concentrations exceed JSCS sediment screening levels, regardless of location relative to a catch basin.

In addition, Figures 3 through 8 summarize COI detected in surface soil samples collected during the RI programs for the Upland Facilities: Figure 3 presents metals concentrations detected in surface soil above regional background concentrations[1]; Figure 4 presents the total PAH concentrations detected in surface soil samples; and Figures 5 through 8 summarize the detected concentrations of PCBs, pesticides, semi-volatile organic compounds (other than PAHs), and TPH, respectively. On each of the figures, a table is included that lists the JSCS sediment screening levels for the detected constituents for comparison. Finally, Tables 1A through 1C provide the detected PAH concentrations in surface soils from the Upland Facilities and include a screen against PECs as represented on Table 3-1 of JSCS sediment screening levels (bioaccumulative sediment screening level values are not provided on the JSCS document ,Table 3-1 for PAHs).

ATTACHMENTS:

Table 1A – PAHs in Surface Soil
Table 1B – PAHs and TPH in Surface Soil Samples
Table 1C – PAH Concentrations in Surface Soil
Figure 1 – Facility Location Map
Figure 2 – Constituents Detected in Surface Soil
Figure 3 – Metals Concentrations Detected Above Regional Background in Surface Soil
Figure 4 – Total Polynuclear Aromatic Hydrocarbons Detected in Surface Soil
Figure 5 – Polychlorinated Biphenyl Concentrations Detected in Surface Soil
Figure 6 – Pesticide Concentrations Detected in Surface Soil
Figure 7 – Semi-Volatile Organic Compounds Detected in Surface Soil (Except Polynuclear Aromatic Hydrocarbons)
Figure 8 – Total Petroleum Hydrocarbon Concentrations Detected in Surface Soil
Figure 9 – Location of Surface Soil Sampling Points, Drainage Basins, and Conveyance Lines
Figure 10 – Exceedances of JSCS Sediment Screening Levels in Surface Soil Within 100 feet of Catch Basins
Figure 11 – Surface Soil Results Compared to JSCS Sediment Screening Levels

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[1] Rrepresented by the Washington Department of Ecology publication Natural Background Soil Metal Concentrations in Washington State dated October 1994.

Table 1A - PAHs in Surface Soil
Terminal 4 Slip 1 Upland Facility

	Sample ID	T4S1S-11	T4S1S-12	T4S1S-13	T4S1S-15-0.5	T4S1S-16-0.5	T4S1S-17-0.5	T4S1S-18-0.5	T4S1S-19-0.5	T4S1S-5	T4S1S-6	T4S1S-7
	Drainage Basin	R	R	R	R	R	R	R	R	R	R	R
	Lab ID	K2502049-008	K2502049-009	K2502049-010	K2502049-010	K2502049-010	K2502049-010	K2502049-010	K2502049-010			
	Sample Interval	0 - 0.5	0 - 0.5	0 - 0.5	0.5 - 1	0.5 - 1	0.5 - 1	0.5 - 1	0.5 - 1	0 - 0.5	0 - 0.5	0 - 0.5
	Sample Date	3/22/2005	3/22/2005	3/22/2005	9/6/2005	9/6/2005	9/6/2005	9/6/2005	9/6/2005	3/22/2005	3/22/2005	3/22/2005
	OU	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1
Compound (Concentrations in µg/kg)	McDonalds PECs											
Naphthalene	561	7.9	76	28	17.5 U, D	140 U	71.8 U	14.2 U	70.8 U	330 U, J	330 U, J	91 J
2-Methylnaphthalene	200	5.3	42	16	--	--	--	--	--	330 U, J	330 U, J	65 J
Acenaphthylene	200	11	29	31	29 J, D	140 U	56.8 J, D	14.2 U	37.4 J, D	330 U, J	330 U, J	97 J
Acenaphthene	300	14	340	200	37.1 J, D	53.5 J, D	37.8 J, D	7.32 J, D	17.6 J, D	340 U, J	340 U, J	350 J
Fluorene	536	6.4	110	65	22.6 J, D	140 U	21.5 J, D	14.2 U	70.8 U	340 U, J	340 U, J	180 J
Dibenzofuran	--	4.4 J	62	36	--	--	--	--	--	340 U, J	340 U, J	100 J
Phenanthrene	1170	90	2000 D	1300 D	258 D	313 D	203 D	37.6 D	136 D	47 J	100 J	1700 J
Anthracene	845	31	350	220	78 D	66.1 J, D	115 D	8.62 J, D	50.2 J, D	30 J	24 J	390 J
Fluoranthene	2230	290	6400 D	3900 D	667 D	853 D	490 D	88.8 D	359 D	26 J	110 J	3100
Pyrene	1520	290	5800 D	3800 D	734 D	900 D	552 D	99.2 D	456 D	77 J	170 J	2700
Benzo(b)fluoranthene	--	310	6200 D	3900 D	616 D	1080 D	631 D	79.5 D	342 D	92 J	210 J	3800
Benzo(k)fluoranthene	13000	300	4200 D	3300 D	627 D	695 D	604 D	85.1 D	378 D	31 J	85 J	1100 J
Benzo(a)anthracene	1050	190	3900 D	2400 D	446 D	581 D	358 D	57.3 D	249 D	52 J	100 J	2200
Chrysene	1290	250	4900 D	3200 D	585 D	789 D	467 D	72 D	335 D	69 J	140 J	2500
Benzo(a)pyrene	1450	310	6000 D	3800 D	616 D	830 D	571 D	83.8 D	354 D	69 J	150 J	2800
Indeno(1,2,3-cd)pyrene	100	390	5400 D	3700 D	344 D	403 D	290 D	41.3 D	185 D	64 J	130 J	2500
Dibenz(a,h)anthracene	1300	77	1100	780	117 D	142 D	99.4 D	14.5 D	61.6 J, D	330 U	35 J	660
Benzo(g,h,i)perylene	300	380	5000 D	3400 D	372 D	416 D	294 D	44.6 D	206 D	93 J	140 J	2600

Notes:

1. PAHs = Polynuclear Aromatic Hydrocarbons by EPA Method 8270C (SIM).
2. µg/kg = Micrograms per kilogram.
3. PEC = Probable Effect Concentration, values taken from Portland Harbor Joint Source Control Strategy, Final - Dec. 2005
4. -- = No screening level available or not analyzed.
5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
7. D = Dilution.
8. **Bold** values indicate that the detected concentration exceeds the PEC.
9. Sample ID nomenclature is per the following: type of sample-sample number-depth in feet-designation.
   For example T4S1SB-46-1-1 = soil boring (SB) number 46, collected 1 foot below the ground surface, primary sample (1).
   Soil sample number 6 = T4S1S-6 = surface

Table 1A - PAHs in Surface Soil
Terminal 4 Slip 1 Upland Facility

	Sample ID	T4S1SB-14-1-1	T4S1SB-15-1-1	T4S1SB-16-1-1	T4S1SB-17-1-1	T4S1SB-18-1-1	T4S1SB-31-0-1	T4S1SB-32-0-1	T4S1SB-33-0-1	T4S1SB-42-1-1	T4S1SB-45-1-1	T4S1SB-46-1-1
	Drainage Basin	R	R	R	R	R	Q	Q	Q	R	R	R
	Lab ID	K2406368-002	K2406804-009	K2406804-007	K2406848-001	K2406699-005	K2406848-007	K2406767-009	K2406804-001	K2406804-003	K2406321-001	K2406321-002
	Sample Interval	1 - 2	1 - 2	0.5 - 1.5	1 - 2	1 - 1.5	0.5 - 1.5	0.5 - 1.5	0.25 - 1	0.5 - 1.5	0.5 - 2	0.5 - 2
	Sample Date	8/24/2004	9/3/2004	9/3/2004	9/7/2004	9/2/2004	9/3/2004	9/3/2004	9/3/2004	9/3/2004	8/23/2004	8/23/2004
	OU	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1
Compound (Concentrations in µg/kg)	McDonalds PECs											
Naphthalene	561	10	2.8 J	2.4 J	2.1 J	20	33	1.3 J	9.9	2.6 J	36	1.2 J
2-Methylnaphthalene	200	6.8	1.4 J	1.5 J	1.4 J	18	50	0.66 J	15	1.4 J	37	0.76 J
Acenaphthylene	200	50	3.5 J	3.2 J	3.8 J	13	14	5 U	7.7	13	27	0.59 J
Acenaphthene	300	11	0.56 J	0.72 J	1.1 J	1.9 J	1.7 J	5 U	0.78 J	1.2 J	1.8 J	4.9 U
Fluorene	536	8.2	0.51 J	0.63 J	1.5 J	1.8 J	2.7 J	5 U	1.4 J	0.66 J	4.2 J	4.9 U
Dibenzofuran	--	7.5	0.54 J	0.75 J	0.37 J	5.5	21	5 U	4 J	0.94 J	9.8	4.9 U
Phenanthrene	1170	260	7.9	7.3	30	51	66	0.66 J	46	17	110	1.2 J
Anthracene	845	68	4.4 J	5	9.3	19	20	5 U	9.4	12	32	0.78 J
Fluoranthene	2230	520	18	15	39	120	73	1.3 J	48	62	280	3.4 J
Pyrene	1520	560	25	20	60	130	110	1.5 J	72	82	360	4.8 J
Benzo(b)fluoranthene	--	320	15	16	14	78	140	1 J	61	58	230	2.1 J
Benzo(k)fluoranthene	13000	260	13	12	15	91	67	0.66 J	49	45	170	1.7 J
Benzo(a)anthracene	1050	210	11	9	24	59	66	0.98 J	38	58	150	2.1 J
Chrysene	1290	340	17	15	27	96	150	0.91 J	63	69	230	2.2 J
Benzo(a)pyrene	1450	320	8.9	12	15	84	97	0.65 J	58	53	250	1.8 J
Indeno(1,2,3-cd)pyrene	100	330	15	15	12	82	84	0.92 J	61	39	280	3 J
Dibenz(a,h)anthracene	1300	53	2.6 J	2.7 J	2.6 J	12	24	5 U	13	9.6	39	0.54 J
Benzo(g,h,i)perylene	300	320	17	16	12	100	110	0.87 J	67	40	290	3.1 J

Notes:

1. PAHs = Polynuclear Aromatic Hydrocarbons by EPA Method 8270C (SIM).
2. µg/kg = Micrograms per kilogram.
3. PEC = Probable Effect Concentration, values taken from Portland Harbor Joint Source Control Strategy, Final - Dec. 2005
4. -- = No screening level available or not analyzed.
5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
7. D = Dilution.
8. **Bold** values indicate that the detected concentration exceeds the PEC.
9. Sample ID nomenclature is per the following: type of sample-sample number-depth in feet-designation.
   For example T4S1SB-46-1-1 = soil boring (SB) number 46, collected 1 foot below the ground surface, primary sample (1).
   Soil sample number 6 = T4S1S-6 = surface

Table 1A - PAHs in Surface Soil
Terminal 4 Slip 1 Upland Facility

	Sample ID	T4S1SB-47-1-1	T4S1SB-48-1-1	T4S1SB-49-1-1	T4S1SB-50-1-1	T4S1SB-82-1-1	T4S1SB-83-1-1	T4S1SB-89-0-1	T4S1SB-90-0-2	T4S1SB-9-0-1	T4S1SB-92-0-1	T4S1SB-93-0-1
	Drainage Basin	R	R	R	R	R	R	Q	Q	R	O	O
	Lab ID	K2406321-004	K2406321-005	K2406321-006	K2406368-001	K2406644-003	K2406644-001			K2406699-003		
	Sample Interval	0.5 - 2	0.5 - 2	0.5 - 2	0.5 - 2.5	0.5 - 1.5	1 - 2	0.5 - 2.5	1 - 3	0 - 1	1 - 3	0.5 - 2.5
	Sample Date	8/23/2004	8/23/2004	8/23/2004	8/23/2004	9/1/2004	9/1/2004	9/7/2005	9/7/2005	9/2/2004	9/7/2005	9/7/2005
	OU	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1	OU1
Compound (Concentrations in µg/kg)	McDonalds PECs											
Naphthalene	561	1.4 J	1.4 J	1.4 J	1.1 J	2.7 J	1.9 J	15.2 U	14.3 U	3.1 J	3.49 J, D	7.47 U, D
2-Methylnaphthalene	200	0.91 J	0.92 J	0.84 J	0.64 J	1.6 J	0.78 J	--	--	1.5 J	--	--
Acenaphthylene	200	0.27 J	0.52 J	5 U	0.46 J	2.3 J	0.47 J	15.2 U	14.3 U	1.7 J	5.88 J, D	7.47 U, D
Acenaphthene	300	4.9 U	4.9 U	5 U	5 U	2.2 J	4.9 U	15.2 U	14.3 U	0.33 J	20.2 D	7.47 U, D
Fluorene	536	4.9 U	4.9 U	5 U	5 U	1.4 J	0.36 J	15.2 U	14.3 U	0.57 J	8.27 J, D	7.47 U, D
Dibenzofuran	--	4.9 U			5 U	0.74 J	0.23 J	--	--	0.49 J	--	--
Phenanthrene	1170	0.79 J	1.3 J	0.87 J	0.56 J	12	1.3 J	7.65 J	14.3 U	4.8	105 D	15.8 J, D
Anthracene	845	0.32 J	0.51 J	5 U	0.65 J	4.8 J	0.81 J	15.2 U	14.3 U	2.6 J	26.3 D	7.47 U, D
Fluoranthene	2230	1.9 J	2.2 J	1.7 J	1.5 J	35	2.7 J	15.3 D	14.3 U	11	263 D	41.9 D
Pyrene	1520	2.5 J	2.6 J	1.7 J	1.7 J	34	3.8 J	24.7 D	5.56 J, D	14	309 D	40.5 D
Benzo(b)fluoranthene	--	1.4 J	1.4 J	1.4 J	1.8 J	24	1.5 J	18.9 D	14.3 U	7	326 D	59.5 J
Benzo(k)fluoranthene	13000	1.1 J	0.85 J	0.9 J	1.1 J	31	2.7 J	13.9 J, D	14.4 U	12	248 D	33.6 J
Benzo(a)anthracene	1050	1.6 J	0.89 J	1.4 J	1.3 J	15	1.5 J	10.1 J, D	14.4 U	5.5	201 D	31.2 D
Chrysene	1290	1.5 J	1.4 J	1.2 J	1.3 J	28	2.7 J	21.4 D	14.3 U	11	238 D	43.3 D
Benzo(a)pyrene	1450	1.4 J	1.2 J	1.1 J	1.2 J	21	2.6 J	16.9 D	4.86 J, D	6.1	281 D	47.8 J
Indeno(1,2,3-cd)pyrene	100	1.7 J	1.9 J	1.4 J	2 J	28	2.8 J	8.8 J, D	14.4 U	9.5	121 D	25.3 J
Dibenz(a,h)anthracene	1300	0.37 J	0.3 J	5 U	5 U	5.9	4.9 U	15.2 U	14.4 U	2 J	43.9 D	12 J
Benzo(g,h,i)perylene	300	1.8 J	2.3 J	1.4 J	2.3 J	26	3.5 J	11 J, D	14.3 U	9.7	133 D	28.1 J

Notes:

1. PAHs = Polynuclear Aromatic Hydrocarbons by EPA Method 8270C (SIM).
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4. -- = No screening level available or not analyzed.
5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
7. D = Dilution.
8. **Bold** values indicate that the detected concentration exceeds the PEC.
9. Sample ID nomenclature is per the following: type of sample-sample number-depth in feet-designation.
   For example T4S1SB-46-1-1 = soil boring (SB) number 46, collected 1 foot below the ground surface, primary sample (1).
   Soil sample number 6 = T4S1S-6 = surface

Table 1A - PAHs in Surface Soil
Terminal 4 Slip 1 Upland Facility

	Sample ID	T4S1SB-94-0-1	T4S1SB-94-0-2	T4S1SB-95-0-1	AOC72-S1-0.5	AOC72-S1-1.5	AOC72-S2-0.5	AOC72-S2-1.5	AOC72-S3-0.5	AOC72-S3-1.5	MW16-0.5-1	T4S1S-10-1
	Drainage Basin	Q	Q	Q	L	L	L	L	L	L	L	K
	Lab ID		K2502049-010								K2402343-006	K2406499-005
	Sample Interval	1 - 3	1 - 3	0.5 - 2.5	0.5 - 1.5	1.5 - 2.5	0.5 - 1.5	1.5 - 2.5	0.5 - 1.5	1.5 - 2.5	0.5 - 1	0 - 0.5
	Sample Date	9/7/2005	9/7/2005	9/7/2005	3/8/2004	3/8/2004	3/8/2004	3/8/2004	3/8/2004	3/8/2004	3/29/2004	8/27/2004
	OU	OU1	OU1	OU1	OU2	OU2	OU2	OU2	OU2	OU2	OU2	OU2
Compound (Concentrations in µg/kg)	McDonalds PECs											
Naphthalene	561	5.75 J, D	5.49 J, D	12 J, D	1.3 J	4.8 U	0.24 J	4.8 U	4.7 U	0.34 J	3.6 J	19
2-Methylnaphthalene	200	--	--	--	1.1 J	4.8 U	4.7 U	4.8 U	4.7 U	4.8 U	--	5.9
Acenaphthylene	200	3.53 U	14.5 U	11.2 J, D	2 J	4.8 U	0.36 J	4.8 U	4.7 U	0.25 J	3.3 J	10
Acenaphthene	300	3.53 U	14.5 U	34.9 D	0.66 J	4.8 U	4.7 U	4.8 U	4.7 U	4.8 U	0.6 J	2.1 J
Fluorene	536	3.53 U	14.5 U	14.3 D	1.7 J	4.8 U	0.2 J	4.8 U	4.7 U	4.8 U	0.56 J	1.9 J
Dibenzofuran	--	--	--	--	0.79 J	4.8 U	4.7 U	4.8 U	4.7 U	4.8 U	--	1.5 J
Phenanthrene	1170	17.4 D	15.3 D	212 D	6.6	1.3 J	1.5 J	1.1 J	1.2 J	0.25 J	9.5	52
Anthracene	845	4.92 J, D	4.47 J, D	41.7 D	2.9 J	0.63 J	1.4 J	0.75 J	0.62 J	0.33 J	3.2 J	13
Fluoranthene	2230	34.8 D	26.7 D	520 D	7.9	1.2 J	2.7 J	0.98 J	1.1 J	0.44 J	30	270
Pyrene	1520	37.5 D	37.9 D	650 D	11	1.2 J	2.9 J	0.91 J	1.1 J	0.55 J	41	380
Benzo(b)fluoranthene	--	40.6 J	31.2 D	644 D	3.7 J	0.16 J	2.3 J	4.8 U	4.7 U	0.42 J	26	200
Benzo(k)fluoranthene	13000	24.9 J	20.3 D	480 D	5.3	0.19 J	1.5 J	0.18 J	0.22 J	0.4 J	25	170
Benzo(a)anthracene	1050	19.8 D	14.5 D	383 D	4.2 J	0.45 J	1.3 J	U	0.22 J	0.21 J	17	180
Chrysene	1290	34.8 D	26.7 D	474 D	6.3	0.38 J	1.9 J	0.21 J	0.31 J	0.41 J	25	250
Benzo(a)pyrene	1450	32.1 J	24.4 D	568 D	4.5 J	0.26 J	0.77 J	0.23 J	0.23 J	0.19 J	37	270
Indeno(1,2,3-cd)pyrene	100	25.8 J	14.2 J, D	242 D	3.7 J	4.8 U	0.9 J	4.8 U	4.7 U	0.28 J	51	240
Dibenz(a,h)anthracene	1300	7.03 J, D	4.1 J, D	84.7 D	0.44 J	4.8 U	4.7 U	4.8 U	4.7 U	4.8 U	7.4	35
Benzo(g,h,i)perylene	300	34.1 J	18.1 D	258 D	4.9 J	0.15 J	1.1 J	0.21 J	4.7 U	0.49 J	64	270

Notes:
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4. -- = No screening level available or not analyzed.
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6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
7. D = Dilution.
8. **Bold** values indicate that the detected concentration exceeds the PEC.
9. Sample ID nomenclature is per the following: type of sample-sample number-depth in feet-designation.
   For example T4S1SB-46-1-1 = soil boring (SB) number 46, collected 1 foot below the ground surface, primary sample (1).
   Soil sample number 6 = T4S1S-6 = surface

Table 1A - PAHs in Surface Soil
Terminal 4 Slip 1 Upland Facility

	Sample ID	T4S1S-14B	T4S1S-8-1	T4S1S-9-1	T4S1SB-53-1-1	T4S1SB-55-1-1	T4S1SB-58-1-1	T4S1SB-70-1-1	T4S1SB-71-1-1	T4S1SB-72-1-1	T4S1SB-73-1-1	T4S1SB-74-1-1
	Drainage Basin	M	L	L	L	M	M	L	L	L	L	L
	Lab ID	K2502049-011	K2406499-007	K2406499-006	K2406534-003	K2406589-004	K2406589-007	K2406457-008	K2406457-007	K2406457-006	K2406457-004	K2406457-003
	Sample Interval	0.5 - 1	0 - 0.5	0 - 0.5	0.5 - 1	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	0.5 - 1.5	1 - 2
	Sample Date	9/8/2005	8/27/2004	8/27/2004	8/27/2004	8/27/2004	8/31/2004	8/26/2004	8/26/2004	8/26/2004	8/26/2004	8/26/2004
	OU	OU2	OU2	OU2	OU2	OU2	OU2	OU2	OU2	OU2	OU2	OU2
Compound (Concentrations in µg/kg)	McDonalds PECs											
Naphthalene	561	14.1 U	1.9 J	6.5	3.2 J	1.9 J	0.98 J	330 U	330 U	330 U	330 U	340 U
2-Methylnaphthalene	200	--	0.7 J	2.1 J	1.5 J	1 J	0.5 J	330 U	330 U	330 U	330 U	340 U
Acenaphthylene	200	14.1 U	1.3 J	6	1.5 J	0.47 J	4.3 U	330 U	330 U	330 U	330 U	340 U
Acenaphthene	300	27.4 D	0.21 J	0.7 J	0.28 J	4.4 U	4.3 U	330 U	330 U	330 U	330 U	340 U
Fluorene	536	12.5 J, D	0.31 J	1.1 J	0.8 J	0.3 J	0.21 J	330 U	330 U	330 U	330 U	340 U
Dibenzofuran	--	347 U	0.35 J	0.88 J	0.54 J	0.38 J	0.25 J	330 U	330 U	330 U	330 U	340 U
Phenanthrene	1170	183 D	1.9 J	14	5.2	3.9 J	0.74 J	330 U	330 U	330 U	330 U	340 U
Anthracene	845	30.9 D	1 J	5.6	2.4 J	0.59 J	4.3 U	330 U	330 U	330 U	330 U	340 U
Fluoranthene	2230	483 D	7.3	38	11	4.6	0.81 J	39 J	330 U	330 U	22 J	340 U
Pyrene	1520	437 D	10	54	15	4.7	0.93 J	34 J	330 U	330 U	19 J	340 U
Benzo(b)fluoranthene	--	476 D	7.7	40	5.7	3.1 J	1.2 J	30 J	330 U	330 U	330 U	340 U
Benzo(k)fluoranthene	13000	438 D	6.4	37	8.8	2.2 J	0.81 J	330 U	330 U	330 U	330 U	340 U
Benzo(a)anthracene	1050	315 D	5.8	26	4.5 J	2.6 J	0.41 J	22 J	330 U	330 U	330 U	340 U
Chrysene	1290	388 D	7	36	9.3	4.2 J	1.3 J	30 J	330 U	330 U	14 J	340 U
Benzo(a)pyrene	1450	455 D	10	55	8	2.1 J	0.7 J	26 J	330 U	330 U	330 U	340 U
Indeno(1,2,3-cd)pyrene	100	209 D	10	63	9.2	2.3 J	1.1 J	330 U	330 U	330 U	330 U	340 U
Dibenz(a,h)anthracene	1300	76.9 D	1.5 J	7.9	1.5 J	0.47 J	0.35 J	330 U	330 U	330 U	330 U	340 U
Benzo(g,h,i)perylene	300	210 D	13	79	11	2.6 J	1.4 J	34 J	330 U	330 U	330 U	340 U

Notes:

1. PAHs = Polynuclear Aromatic Hydrocarbons by EPA Method 8270C (SIM).
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5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
7. D = Dilution.
8. **Bold** values indicate that the detected concentration exceeds the PEC.
9. Sample ID nomenclature is per the following: type of sample-sample number-depth in feet-designation.
   For example T4S1SB-46-1-1 = soil boring (SB) number 46, collected 1 foot below the ground surface, primary sample (1).
   Soil sample number 6 = T4S1S-6 = surface

Table 1A - PAHs in Surface Soil
Terminal 4 Slip 1 Upland Facility

	Sample ID	T4S1SB-75-1-1	T4S1SB-76-1-1	T4S1SB-77-1-1	T4S1SB-78-1-1	T4S1SB-79-3-1	T4S1SB-80-3-1	T4S1SB-81-3-1
	Drainage Basin	L	L	N	N	N	N	N
	Lab ID	K2406457-002	K2406457-001	K2406532-001	K2406532-003	K2406589-001	K2406532-005	K2406532-006
	Sample Interval	1 - 2	1 - 2	0.5 - 1	0.5 - 1.5	2.5 - 3.5	2.5 - 3.5	2.5 - 3.5
	Sample Date	8/26/2004	8/26/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004
	OU	OU2	OU2	OU2	OU2	OU2	OU2	OU2
Compound (Concentrations in µg/kg)	McDonalds PECs							
Naphthalene	561	120 J	330 U	330 U	330 U	5	1.3 J	0.84 J
2-Methylnaphthalene	200	93 J	330 U	330 U	330 U	6.6	0.58 J	5 U
Acenaphthylene	200	22 J	330 U	330 U	330 U	0.78 J	5 U	5 U
Acenaphthene	300	330 U	330 U	330 U	330 U	0.46 J	5 U	5 U
Fluorene	536	330 U	330 U	330 U	330 U	0.57 J	5 U	5 U
Dibenzofuran	--	43 J	330 U	330 U	330 U	2.3 J	0.22 J	5 U
Phenanthrene	1170	150 J	16 J	14 J	330 U	11	5 U	5 U
Anthracene	845	46 J	330 U	330 U	330 U	0.92 J	5 U	5 U
Fluoranthene	2230	250 J	36 J	19 J	18 J	9.1	0.44 J	0.39 J
Pyrene	1520	200 J	31 J	330 U	17 J	11	0.4 J	5 U
Benzo(b)fluoranthene	--	190 J	22 J	330 U	330 U	5.8	0.54 J	5 U
Benzo(k)fluoranthene	13000	150 J	330 U	330 U	330 U	5.3	5 U	5 U
Benzo(a)anthracene	1050	120 J	19 J	330 U	330 U	5.5	0.27 J	5 U
Chrysene	1290	240 J	25 J	330 U	330 U	8.3	5 U	5 U
Benzo(a)pyrene	1450	150 J	330 U	330 U	330 U	6.6	0.26 J	5 U
Indeno(1,2,3-cd)pyrene	100	170 J	330 U	330 U	330 U	6.2	0.28 J	5 U
Dibenz(a,h)anthracene	1300	38 J	330 U	330 U	330 U	1.1 J	5 U	5 U
Benzo(g,h,i)perylene	300	190 J	33 J	330 U	330 U	7.4	0.31 J	5 U

Notes:
1. PAHs = Polynuclear Aromatic Hydrocarbons by EPA Method 8270C (SIM).
2. µg/kg = Micrograms per kilogram.
3. PEC = Probable Effect Concentration, values taken from Portland Harbor Joint Source Control Strategy, Final - Dec. 2005
4. -- = No screening level available or not analyzed.
5. J = The result is an estimated concentration that is less than the method reporting limit (MRL) but greater than or equal to the method detection limit (MDL).
6. U = The compound was analyzed for but was not detected at or above the MRL/MDL.
7. D = Dilution.
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9. Sample ID nomenclature is per the following: type of sample-sample number-depth in feet-designation.
   For example T4S1SB-46-1-1 = soil boring (SB) number 46, collected 1 foot below the ground surface, primary sample (1).
   Soil sample number 6 = T4S1S-6 = surface

Table 1B - PAHs and TPH in Surface Soil Samples
Terminal 4 Slip 3 Remedial Investigation

	Lab ID	K9909106-001	K9909106-002	K9909106-003	K9909106-004	K9909106-005	K9909106-006	K9909106-007	K9909106-008	K9909106-008
	Sample ID	HC-SS-01	HC-SS-02	HC-SS-03	HC-SS-04	HC-SS-05	HC-SS-06	HC-SS-07	HC-SS-08	HC-SS-08 (dup)
	Drainage Basin	D	D	D	J	K	D	D	D	D
	Sampling Date	12/16/99	12/16/99	12/16/99	12/16/99	12/16/99	12/16/99	12/16/99	12/16/99	12/16/99
	Depth in Feet	1-2	2-3	2-3	0-1	1-2	0-1	1-2	1-2	1-2
PAHs in mg/kg	PECs (McDonalds et al)									
2-Methylnaphthalene	0.2	0.02	0.005 U	0.021	0.024	0.008	**500** J	**2**	0.02	0.005 U
Acenaphthene	0.3	0.005 U	0.005 U	0.005 U	0.25	0.005 U	**12** J	0.12	0.005	0.028
Acenaphthylene	0.2	0.007	0.005 U	0.005 U	0.006	0.005 U	0.05 UJ	0.005 U	0.005 U	0.005 U
Anthracene	0.845	0.011	0.005 U	0.016	0.31	0.007	**4.5** J	0.04	0.015	0.035
Fluorene	0.536	0.005 U	0.005 U	0.008	0.1	0.005 U	**19** J	0.15	0.005 U	0.012
Naphthalene	0.561	0.017	0.005 U	0.008	0.033	0.008	**49** J	0.024	0.016	0.005 U
Phenanthrene	1.17	0.03	0.005 U	0.064	**1.3**	0.023	**29** J	0.18	0.054	0.15
Benzo(a)anthracene	1.05	0.099	0.005 U	0.12	**2.2**	0.048	0.26 J	0.013	0.052	0.27
Benzo(a)pyrene	1.45	0.15	0.005 U	0.005 U	**2.9**	0.07	0.05 UJ	0.023	0.067	0.38
Benzo(b)fluoranthene	--	0.1	0.005 U	0.08	2.5	0.048	0.05 UJ	0.024	0.064	0.34
Benzo(k)fluoranthene	13	0.14	0.007	0.026	2.4	0.056	0.26 J	0.023	0.066	0.32
Benzo(g,h,i)perylene	0.3	0.16	0.007	0.047	**1.7**	0.069	0.05 UJ	0.043	0.064	0.28
Chrysene	1.29	0.14	0.006	0.33	**2.3**	0.057	0.43 J	0.028	0.068	0.31
Dibenz(a,h)anthracene	1.3	0.018	0.005 U	0.014	0.35	0.008	0.05 UJ	0.005	0.011	0.06
Fluoranthene	2.23	0.17	0.006	0.052	**2.9**	0.088	1.1 J	0.04	0.11	0.4
Indeno(1,2,3-cd)pyrene	0.1	**0.16**	0.007	0.021	**2.7**	0.073	0.05 UJ	0.041	0.066	**0.35**
Pyrene	1.52	0.23	0.008	0.15	**2.8**	0.11	**1.6** J	0.061	0.1	0.35
Dibenzofuran	--	0.007	0.005 U	0.005 U	0.048	0.005 U	4.9 J	0.005 U	0.009	0.006
TPH[1] in mg/kg										
Diesel Region	**--**	25 U	25 U	2500	25 U	25 U	430	30000	25 U	
Oil Region	--	50 U	50 U	3800	110	50 U	120	5000 U	84	

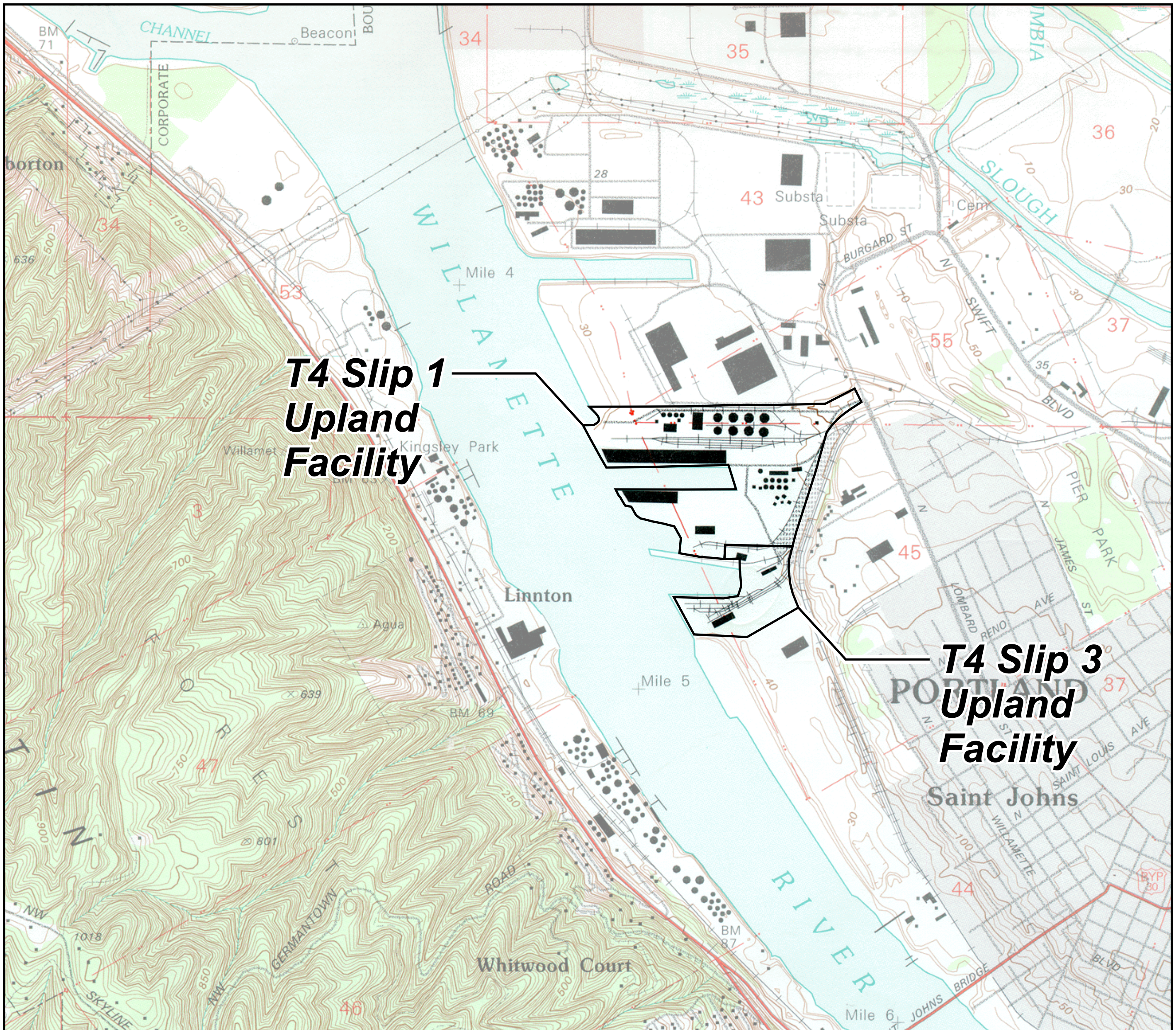
Notes:
1. J = Estimated value.
2. U = Not detected at the indicated sample quantitaion limit.
3. 1 = Area resampled for PAH analyses
4. **Bold** = Exceeds PEC

Table 1C - PAH Concentrations in Surface Soil
Quaker State Tank Farm Area

	Sample ID	Soil #1	Soil #2	Soil #2B	Soil #13	Soil #14	Soil #15	Soil #16	Soil #17	Soil #18	Soil #19	Soil #20	Soil #21	Soil #22	Soil #23	Soil #24	Soil #25
	Depth (ft)	0.5 - 3.0	0.5 - 3.0	1.5 - 2.0	1.0 - 1.5	1.0 - 1.5	1.0 - 1.5	3.0 - 3.5	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Date	8-Oct-04	11-Oct-04	4-Nov-04	11-Oct-04	11-Oct-04	11-Oct-04	11-Oct-04	5-Nov-04	4-Nov-04	4-Nov-05	4-Nov-04	4-Nov-04	4-Nov-04	4-Nov-04	5-Nov-04	5-Nov-04
Analyte (Concentrations in µg/kg [ppb])	McDonalds PECs																
Acenaphthene	300	27.9	158	< 67.0	< 67.0	70.3	< 134	16.0	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0
Acenaphthylene	200	< 13.4	< 67.0	< 67.0	< 67.0	< 67.0	< 134	< 13.4	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0
Anthracene	845	25.5	124	< 67.0	< 67.0	< 67.0	< 134	16.1	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0
Benzo(a)anthracene	1,050	267	1,050	138	74.2	532	192	115	624	1,250	637	552	648	257	< 134	327	85.7
Benzo(a)pyrene	1,450	348	1,220	238	107	655	194	144	818	1,580	876	665	810	305	170	374	108
Benzo(b)fluoranthene	--	344	1,150	179	85.5	638	170	131	760	1,710	854	519	830	359	166	417	112
Benzo(ghi)perylene	300	318	1,060	242	132	603	251	133	844	1,260	744	593	793	301	473	348	107
Benzo(k)fluoranthene	13,000	245	913	145	67.4	461	142	102	628	1,130	595	500	581	250	< 134	322	79.5
Chrysene	1,290	322	1,190	188	96.8	616	231	120	695	1,430	749	631	763	328	163	382	98.4
Dibenzo(a,h)anthracene	1,300	93.3	333	< 67.0	< 67.0	184	< 134	39.8	< 335	369	169	< 134	201	< 134	< 134	< 268	< 67.0
Fluoranthene	2,230	401	1,800	229	124	866	321	158	934	1,910	1,020	957	1,110	415	190	513	126
Fluorene	536	14.5	77.8	< 67.0	< 67.0	< 67.0	< 134	< 13.4	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0
Indeno(1,2,3-cd)pyrene	100	280	968	174	95.2	537	166	116	590	1,080	597	456	632	254	169	301	84.5
Naphthalene	561	< 13.4	< 67.0	< 67.0	< 67.0	< 67.0	< 134	< 13.4	< 335	< 335	< 134	< 134	< 134	< 134	< 134	< 268	< 67.0
Phenanthrene	1,170	167	776	< 67.0	< 67.0	352	174	68.6	365	761	349	230	484	186	< 134	< 268	< 67.0
Pyrene	1,520	432	1,400	308	144	766	563	153	878	1,630	1,080	1,070	981	370	446	449	121

Notes:
1. **Bold** Represents Detected Concentrations Above PEC.
2. < = Not Detected at Associated Method Reporting Limit.
3. RBC = Oregon DEQ Risk Based Concentration (December 17, 2003) - Direct Contact with Soil.
4. PRG = EPA Region IX Preliminary Remediation Goal (October 1, 2002) - Direct Contact with Soil.
5. NA = Not Available.

** The former Quaker State Tank Farm area, while in Basin J, does not drain to any of the catch basins; surface water in this area infiltrates.



Base map prepared from the USGS 7.5-minute quadrangle of Linnton, Oregon, dated 1990.

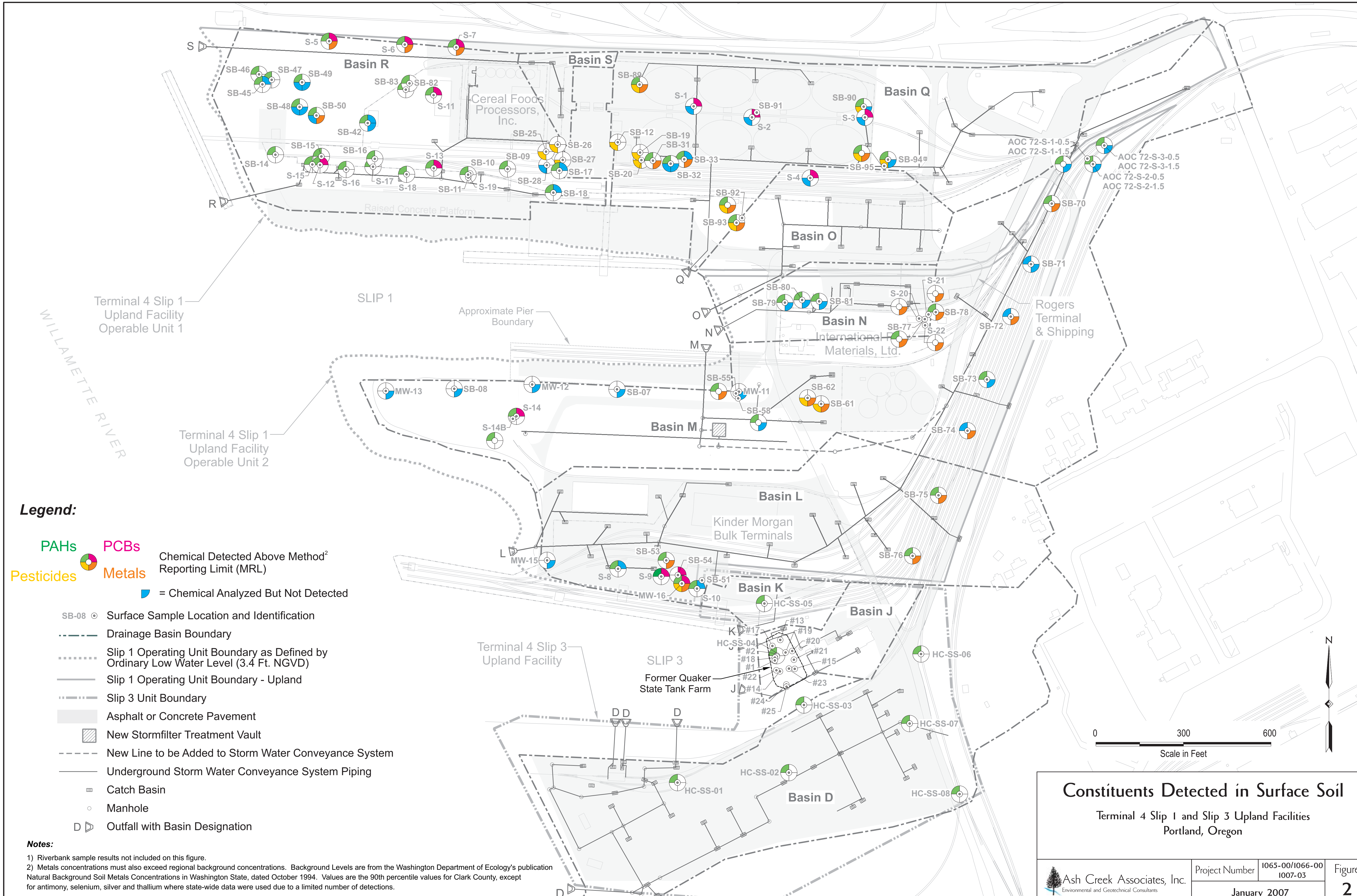
0 2000 4000
Scale in Feet

N

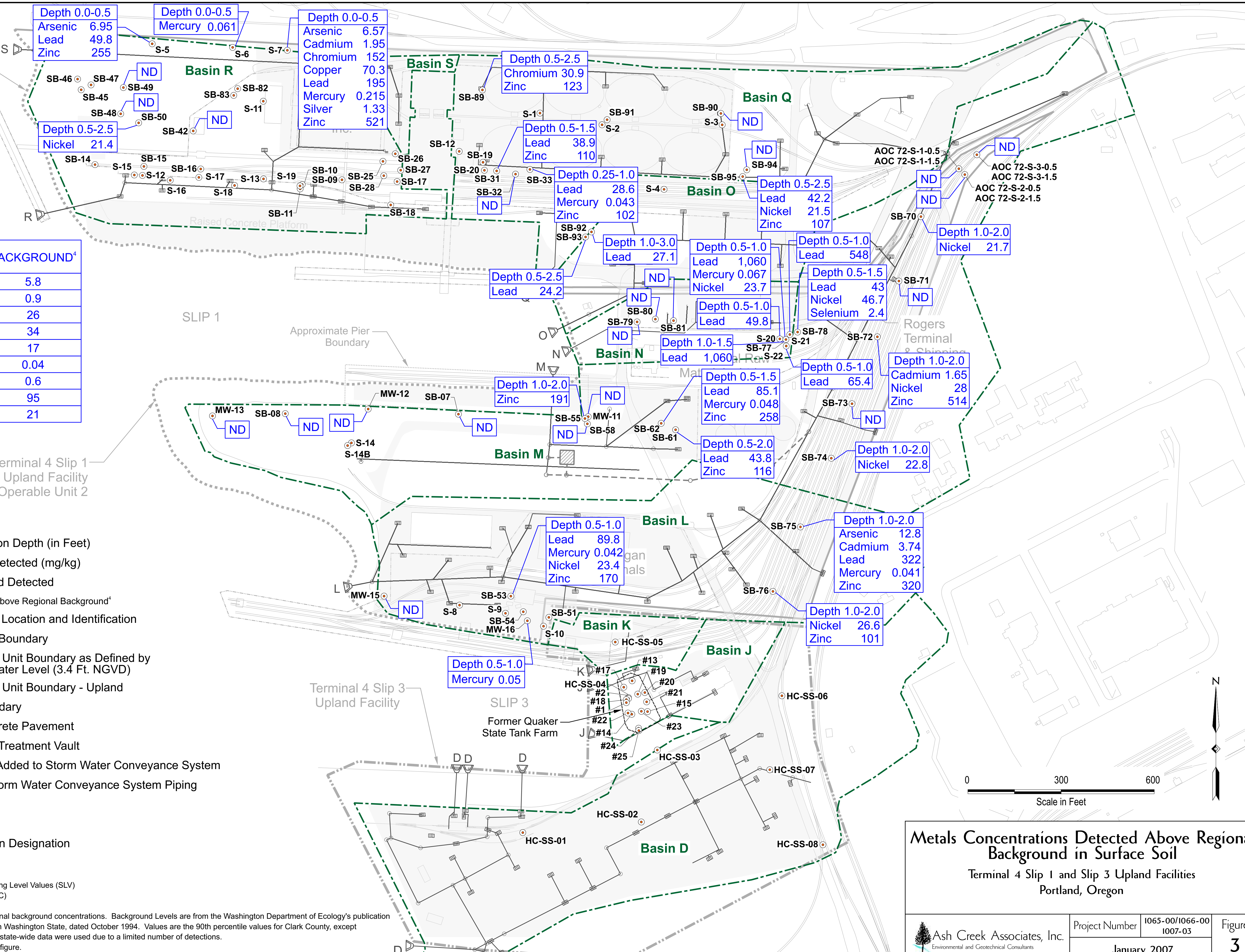
Facility Location Map

Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number	1065-00/1066-00 1007-03	Figure
	February 2007		1



Basin R
Basin S
Basin Q
Basin O
Basin N
Basin M
Basin L
Basin K
Basin J
Basin D
Cereal Foods Processors, Inc.
Raised Concrete Platform
SLIP 1
Approximate Pier Boundary
Terminal 4 Slip 1 Upland Facility Operable Unit 1
Terminal 4 Slip 1 Upland Facility Operable Unit 2
WILLAMETTE RIVER
Rogers Terminal & Shipping
International Raw Materials, Ltd.
Kinder Morgan Bulk Terminals
Terminal 4 Slip 3 Upland Facility
SLIP 3
Former Quaker State Tank Farm
AOC 72-S-1-0.5
AOC 72-S-1-1.5
AOC 72-S-3-0.5
AOC 72-S-3-1.5
AOC 72-S-2-0.5
AOC 72-S-2-1.5
0
300
600
Scale in Feet
N
Legend:
PAHs
PCBs
Pesticides
Metals
Chemical Detected Above Method[2] Reporting Limit (MRL)
= Chemical Analyzed But Not Detected
SB-08 Surface Sample Location and Identification
Drainage Basin Boundary
Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (3.4 Ft. NGVD)
Slip 1 Operating Unit Boundary - Upland
Slip 3 Unit Boundary
Asphalt or Concrete Pavement
New Stormfilter Treatment Vault
New Line to be Added to Storm Water Conveyance System
Underground Storm Water Conveyance System Piping
Catch Basin
Manhole
D Outfall with Basin Designation
Notes:
1) Riverbank sample results not included on this figure.
2) Metals concentrations must also exceed regional background concentrations. Background Levels are from the Washington Department of Ecology's publication Natural Background Soil Metals Concentrations in Washington State, dated October 1994. Values are the 90th percentile values for Clark County, except for antimony, selenium, silver and thallium where state-wide data were used due to a limited number of detections.
Constituents Detected in Surface Soil
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon
Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants
Project Number
1065-00/1066-00 1007-03
January 2007
Figure
2



	JSCS SLV[1]		BACKGROUND[4]
	PEC[2]	DEQ SLV[3]	
Arsenic	33	--	5.8
Cadmium	4.98	0.003	0.9
Chromium	111	4,200	26
Copper	149	10	34
Lead	128	128	17
Mercury	1.06	--	0.04
Silver	5.0	--	0.6
Zinc	459	3.0	95
Nickel	48.6	316	21

Legend:

Depth 2.5-3.5 — Sample Collection Depth (in Feet)
Nickel 21 — Concentration Detected (mg/kg)
Metal Compound Detected
ND = Not Detected Above Regional Background[4]
SB-08 — Surface Sample Location and Identification
Drainage Basin Boundary
Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (3.4 Ft. NGVD)
Slip 1 Operating Unit Boundary - Upland
Slip 3 Unit Boundary
Asphalt or Concrete Pavement
New Stormfilter Treatment Vault
New Line to be Added to Storm Water Conveyance System
Underground Storm Water Conveyance System Piping
Catch Basin
Manhole
D — Outfall with Basin Designation

Notes:

1) Joint Source Control Strategy (JSCS) Screening Level Values (SLV)
2) Toxicity = Probable Effects Concentration (PEC)
3) Bioaccumulation = DEQ Sediment SLVs
4) Metals concentrations must also exceed regional background concentrations. Background Levels are from the Washington Department of Ecology's publication Natural Background Soil Metals Concentrations in Washington State, dated October 1994. Values are the 90th percentile values for Clark County, except for antimony, selenium, silver and thallium where state-wide data were used due to a limited number of detections.
5) Riverbank sample results not included on this figure.

Metals Concentrations Detected Above Regional Background in Surface Soil

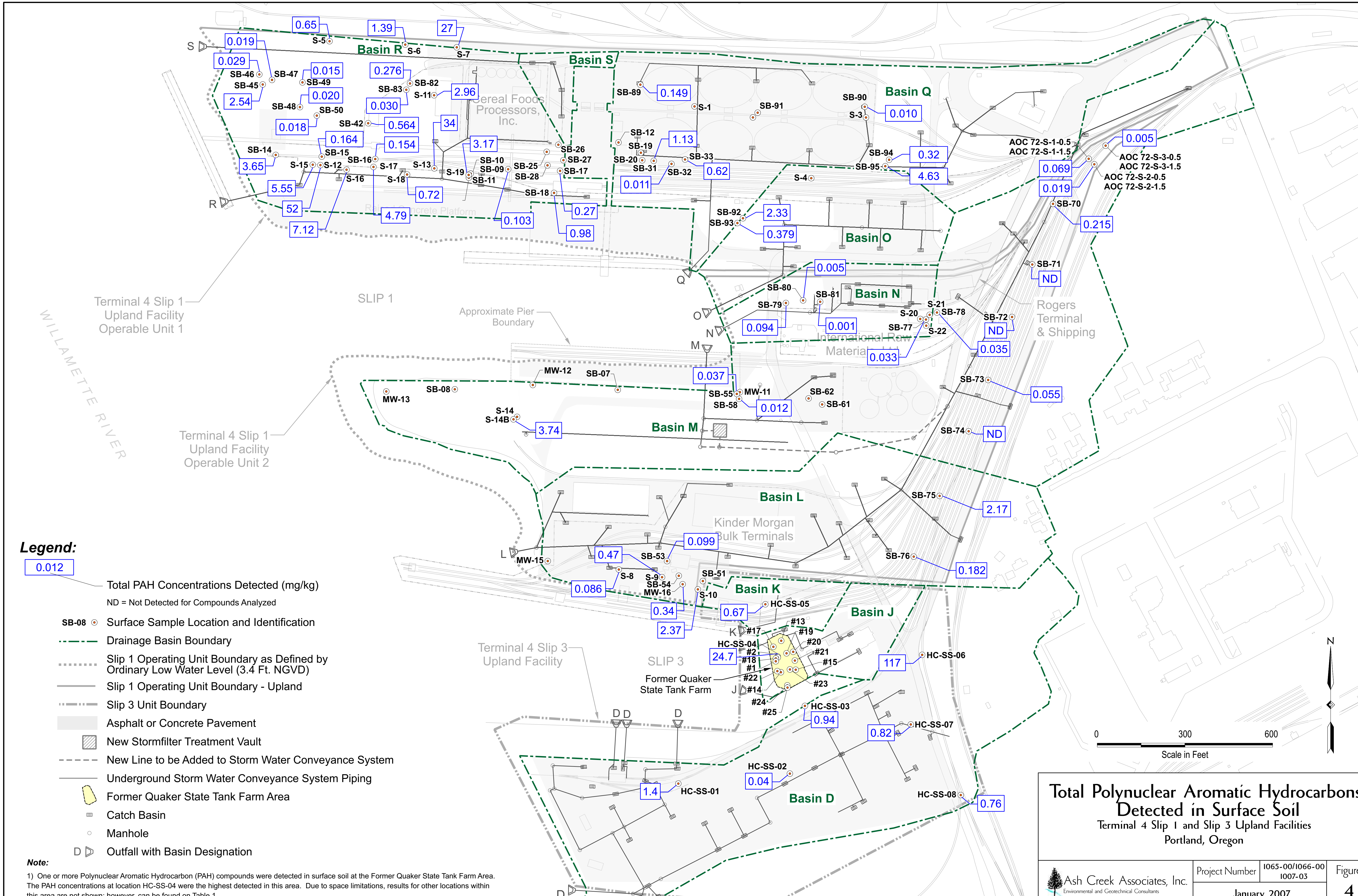
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants

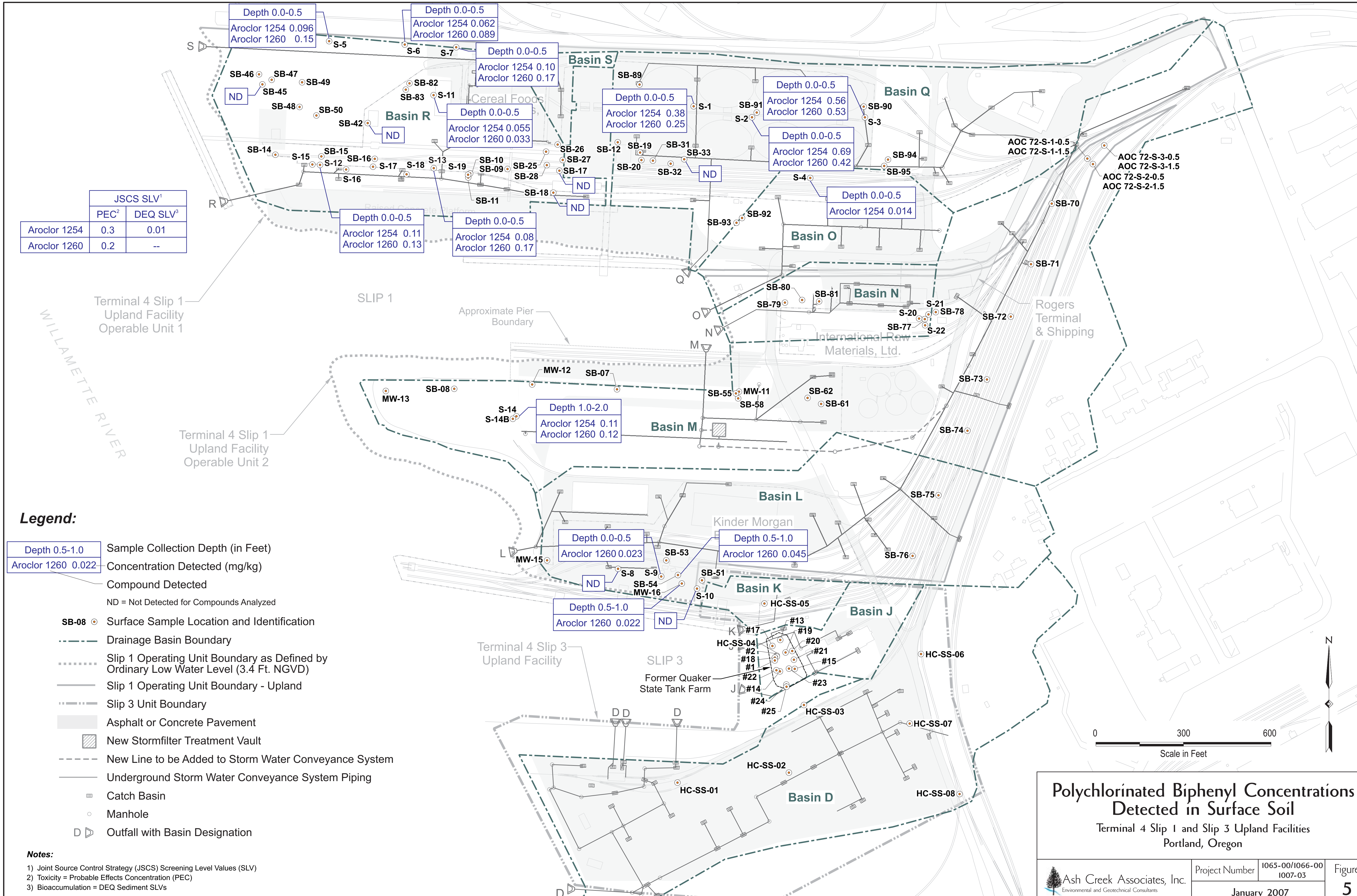
Project Number 1065-00/1066-00 1007-03

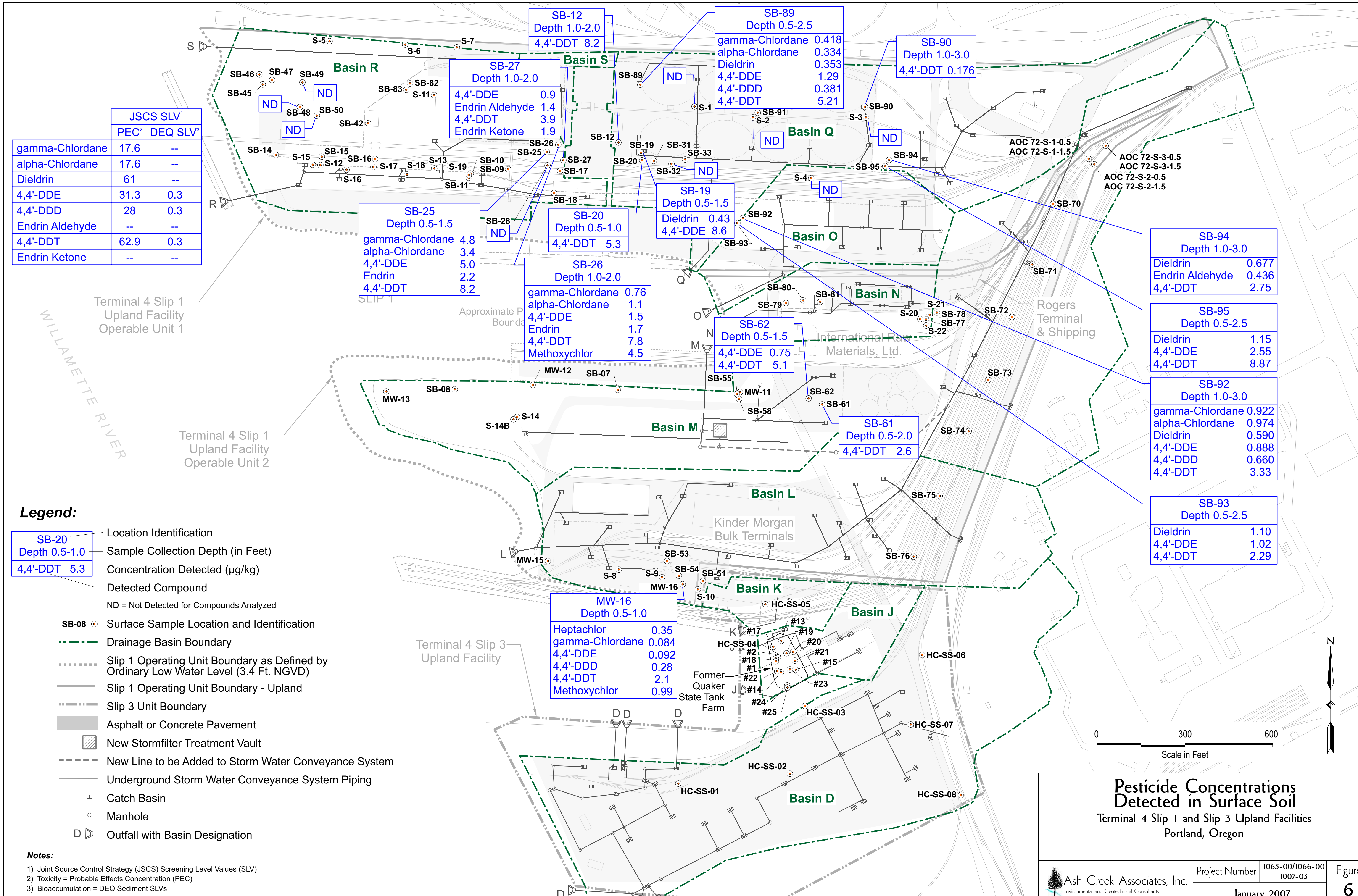
January 2007

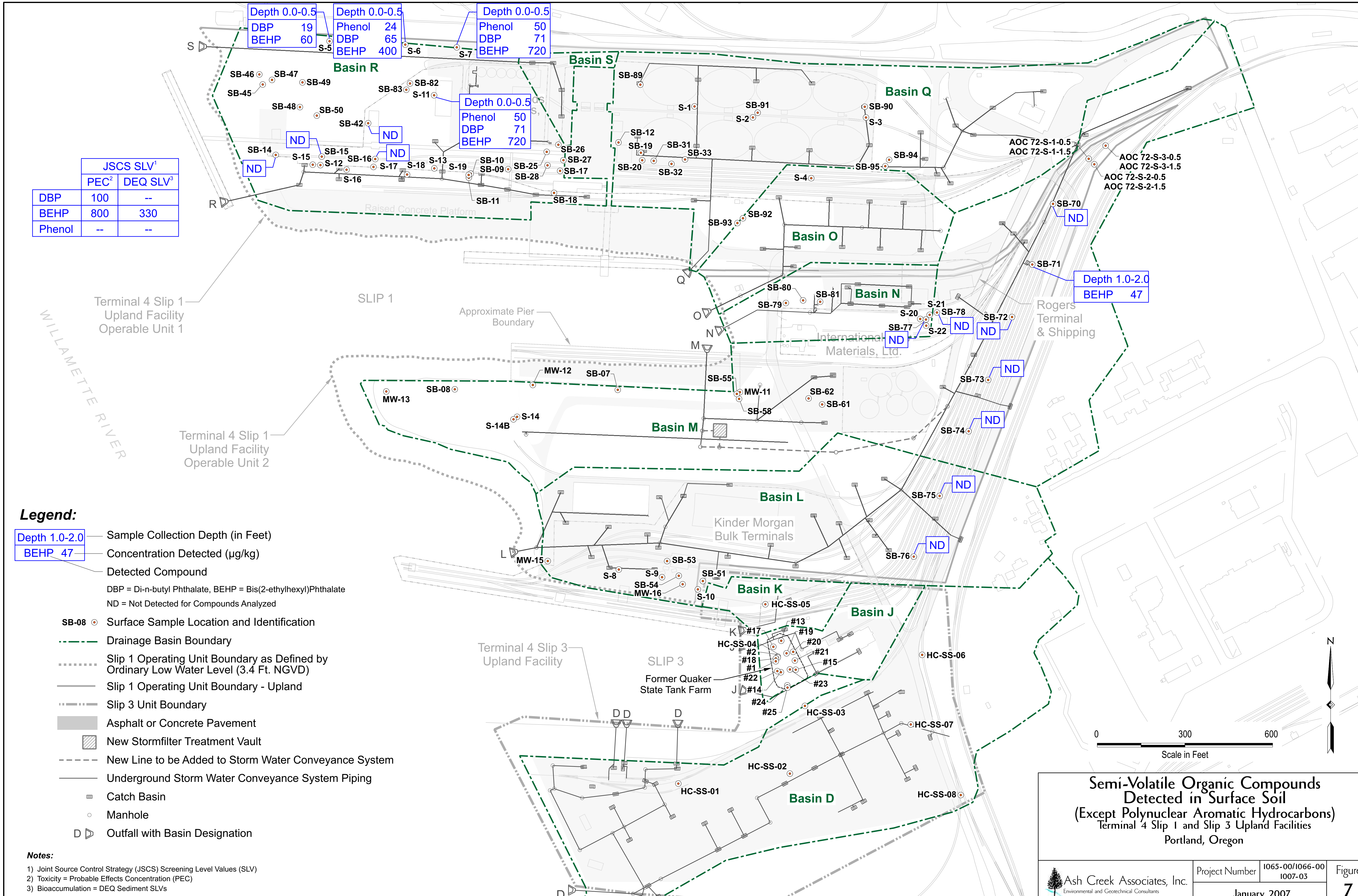
Figure 3



Basin R
Basin S
Basin Q
Basin O
Basin N
Basin M
Basin L
Basin K
Basin J
Basin D
Cereal Food Processors, Inc.
Terminal 4 Slip 1 Upland Facility Operable Unit 1
Terminal 4 Slip 1 Upland Facility Operable Unit 2
Terminal 4 Slip 3 Upland Facility
SLIP 1
SLIP 3
WILLAMETTE RIVER
Approximate Pier Boundary
Rogers Terminal & Shipping
International Raw Materials
Kinder Morgan Bulk Terminals
Former Quaker State Tank Farm
Legend:
0.012
Total PAH Concentrations Detected (mg/kg)
ND = Not Detected for Compounds Analyzed
SB-08 Surface Sample Location and Identification
Drainage Basin Boundary
Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (3.4 Ft. NGVD)
Slip 1 Operating Unit Boundary - Upland
Slip 3 Unit Boundary
Asphalt or Concrete Pavement
New Stormfilter Treatment Vault
New Line to be Added to Storm Water Conveyance System
Underground Storm Water Conveyance System Piping
Former Quaker State Tank Farm Area
Catch Basin
Manhole
D Outfall with Basin Designation
Note:
1) One or more Polynuclear Aromatic Hydrocarbon (PAH) compounds were detected in surface soil at the Former Quaker State Tank Farm Area. The PAH concentrations at location HC-SS-04 were the highest detected in this area. Due to space limitations, results for other locations within this area are not shown; however, can be found on Table 1.
0
300
600
Scale in Feet
N
Total Polynuclear Aromatic Hydrocarbons Detected in Surface Soil
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon
Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants
Project Number
1065-00/1066-00 1007-03
January 2007
Figure
4


Polychlorinated Biphenyl Concentrations Detected in Surface Soil
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon
Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants
Project Number 1065-00/1066-00 1007-03
January 2007
Figure 5
JSCS SLV1
PEC2 DEQ SLV3
Aroclor 1254 0.3 0.01
Aroclor 1260 0.2 --
Depth 0.0-0.5 Aroclor 1254 0.096 Aroclor 1260 0.15
Depth 0.0-0.5 Aroclor 1254 0.062 Aroclor 1260 0.089
Depth 0.0-0.5 Aroclor 1254 0.10 Aroclor 1260 0.17
Depth 0.0-0.5 Aroclor 1254 0.055 Aroclor 1260 0.033
Depth 0.0-0.5 Aroclor 1254 0.38 Aroclor 1260 0.25
Depth 0.0-0.5 Aroclor 1254 0.56 Aroclor 1260 0.53
Depth 0.0-0.5 Aroclor 1254 0.69 Aroclor 1260 0.42
Depth 0.0-0.5 Aroclor 1254 0.014
Depth 0.0-0.5 Aroclor 1254 0.11 Aroclor 1260 0.13
Depth 0.0-0.5 Aroclor 1254 0.08 Aroclor 1260 0.17
Depth 1.0-2.0 Aroclor 1254 0.11 Aroclor 1260 0.12
Depth 0.0-0.5 Aroclor 1260 0.023
Depth 0.5-1.0 Aroclor 1260 0.045
Depth 0.5-1.0 Aroclor 1260 0.022
ND
Basin S
Basin R
Basin Q
Basin O
Basin N
Basin M
Basin L
Basin K
Basin J
Basin D
Cereal Foods
Terminal 4 Slip 1 Upland Facility Operable Unit 1
Terminal 4 Slip 1 Upland Facility Operable Unit 2
Terminal 4 Slip 3 Upland Facility
SLIP 1
SLIP 3
WILLAMETTE RIVER
Approximate Pier Boundary
Rogers Terminal & Shipping
International Raw Materials, Ltd.
Kinder Morgan
Former Quaker State Tank Farm
AOC 72-S-1-0.5
AOC 72-S-1-1.5
AOC 72-S-3-0.5
AOC 72-S-3-1.5
AOC 72-S-2-0.5
AOC 72-S-2-1.5
Legend:
Depth 0.5-1.0 Sample Collection Depth (in Feet)
Aroclor 1260 0.022 Concentration Detected (mg/kg)
Compound Detected
ND = Not Detected for Compounds Analyzed
SB-08 Surface Sample Location and Identification
Drainage Basin Boundary
Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (3.4 Ft. NGVD)
Slip 1 Operating Unit Boundary - Upland
Slip 3 Unit Boundary
Asphalt or Concrete Pavement
New Stormfilter Treatment Vault
New Line to be Added to Storm Water Conveyance System
Underground Storm Water Conveyance System Piping
Catch Basin
Manhole
D Outfall with Basin Designation
Notes:
1) Joint Source Control Strategy (JSCS) Screening Level Values (SLV)
2) Toxicity = Probable Effects Concentration (PEC)
3) Bioaccumulation = DEQ Sediment SLVs
0 300 600
Scale in Feet
N


JSCS SLV[1]
PEC[2]
DEQ SLV[3]
gamma-Chlordane 17.6 --
alpha-Chlordane 17.6 --
Dieldrin 61 --
4,4'-DDE 31.3 0.3
4,4'-DDD 28 0.3
Endrin Aldehyde -- --
4,4'-DDT 62.9 0.3
Endrin Ketone -- --
SB-12 Depth 1.0-2.0 4,4'-DDT 8.2
SB-27 Depth 1.0-2.0 4,4'-DDE 0.9 Endrin Aldehyde 1.4 4,4'-DDT 3.9 Endrin Ketone 1.9
SB-89 Depth 0.5-2.5 gamma-Chlordane 0.418 alpha-Chlordane 0.334 Dieldrin 0.353 4,4'-DDE 1.29 4,4'-DDD 0.381 4,4'-DDT 5.21
SB-90 Depth 1.0-3.0 4,4'-DDT 0.176
SB-25 Depth 0.5-1.5 gamma-Chlordane 4.8 alpha-Chlordane 3.4 4,4'-DDE 5.0 Endrin 2.2 4,4'-DDT 8.2
SB-20 Depth 0.5-1.0 4,4'-DDT 5.3
SB-19 Depth 0.5-1.5 Dieldrin 0.43 4,4'-DDE 8.6
SB-26 Depth 1.0-2.0 gamma-Chlordane 0.76 alpha-Chlordane 1.1 4,4'-DDE 1.5 Endrin 1.7 4,4'-DDT 7.8 Methoxychlor 4.5
SB-62 Depth 0.5-1.5 4,4'-DDE 0.75 4,4'-DDT 5.1
SB-61 Depth 0.5-2.0 4,4'-DDT 2.6
SB-94 Depth 1.0-3.0 Dieldrin 0.677 Endrin Aldehyde 0.436 4,4'-DDT 2.75
SB-95 Depth 0.5-2.5 Dieldrin 1.15 4,4'-DDE 2.55 4,4'-DDT 8.87
SB-92 Depth 1.0-3.0 gamma-Chlordane 0.922 alpha-Chlordane 0.974 Dieldrin 0.590 4,4'-DDE 0.888 4,4'-DDD 0.660 4,4'-DDT 3.33
SB-93 Depth 0.5-2.5 Dieldrin 1.10 4,4'-DDE 1.02 4,4'-DDT 2.29
MW-16 Depth 0.5-1.0 Heptachlor 0.35 gamma-Chlordane 0.084 4,4'-DDE 0.092 4,4'-DDD 0.28 4,4'-DDT 2.1 Methoxychlor 0.99
ND
Basin R
Basin S
Basin Q
Basin O
Basin N
Basin M
Basin L
Basin K
Basin J
Basin D
Terminal 4 Slip 1 Upland Facility Operable Unit 1
Terminal 4 Slip 1 Upland Facility Operable Unit 2
Terminal 4 Slip 3 Upland Facility
WILLAMETTE RIVER
Rogers Terminal & Shipping
International Raw Materials, Ltd.
Kinder Morgan Bulk Terminals
Former Quaker State Tank Farm
Legend:
SB-20 Depth 0.5-1.0 4,4'-DDT 5.3
Location Identification
Sample Collection Depth (in Feet)
Concentration Detected (µg/kg)
Detected Compound
ND = Not Detected for Compounds Analyzed
SB-08 Surface Sample Location and Identification
Drainage Basin Boundary
Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (3.4 Ft. NGVD)
Slip 1 Operating Unit Boundary - Upland
Slip 3 Unit Boundary
Asphalt or Concrete Pavement
New Stormfilter Treatment Vault
New Line to be Added to Storm Water Conveyance System
Underground Storm Water Conveyance System Piping
Catch Basin
Manhole
D Outfall with Basin Designation
Notes:
1) Joint Source Control Strategy (JSCS) Screening Level Values (SLV)
2) Toxicity = Probable Effects Concentration (PEC)
3) Bioaccumulation = DEQ Sediment SLVs
0 300 600
Scale in Feet
N
Pesticide Concentrations Detected in Surface Soil
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon
Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants
Project Number 1065-00/1066-00 1007-03
January 2007
Figure 6



	JSCS SLV[1]	
	PEC[2]	DEQ SLV[3]
DBP	100	--
BEHP	800	330
Phenol	--	--

Legend:

Depth 1.0-2.0 — Sample Collection Depth (in Feet)

BEHP 47 — Concentration Detected (µg/kg)

Detected Compound

DBP = Di-n-butyl Phthalate, BEHP = Bis(2-ethylhexyl)Phthalate

ND = Not Detected for Compounds Analyzed

SB-08 — Surface Sample Location and Identification

Drainage Basin Boundary

Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (3.4 Ft. NGVD)

Slip 1 Operating Unit Boundary - Upland

Slip 3 Unit Boundary

Asphalt or Concrete Pavement

New Stormfilter Treatment Vault

New Line to be Added to Storm Water Conveyance System

Underground Storm Water Conveyance System Piping

Catch Basin

Manhole

D — Outfall with Basin Designation

Notes:

1) Joint Source Control Strategy (JSCS) Screening Level Values (SLV)
2) Toxicity = Probable Effects Concentration (PEC)
3) Bioaccumulation = DEQ Sediment SLVs

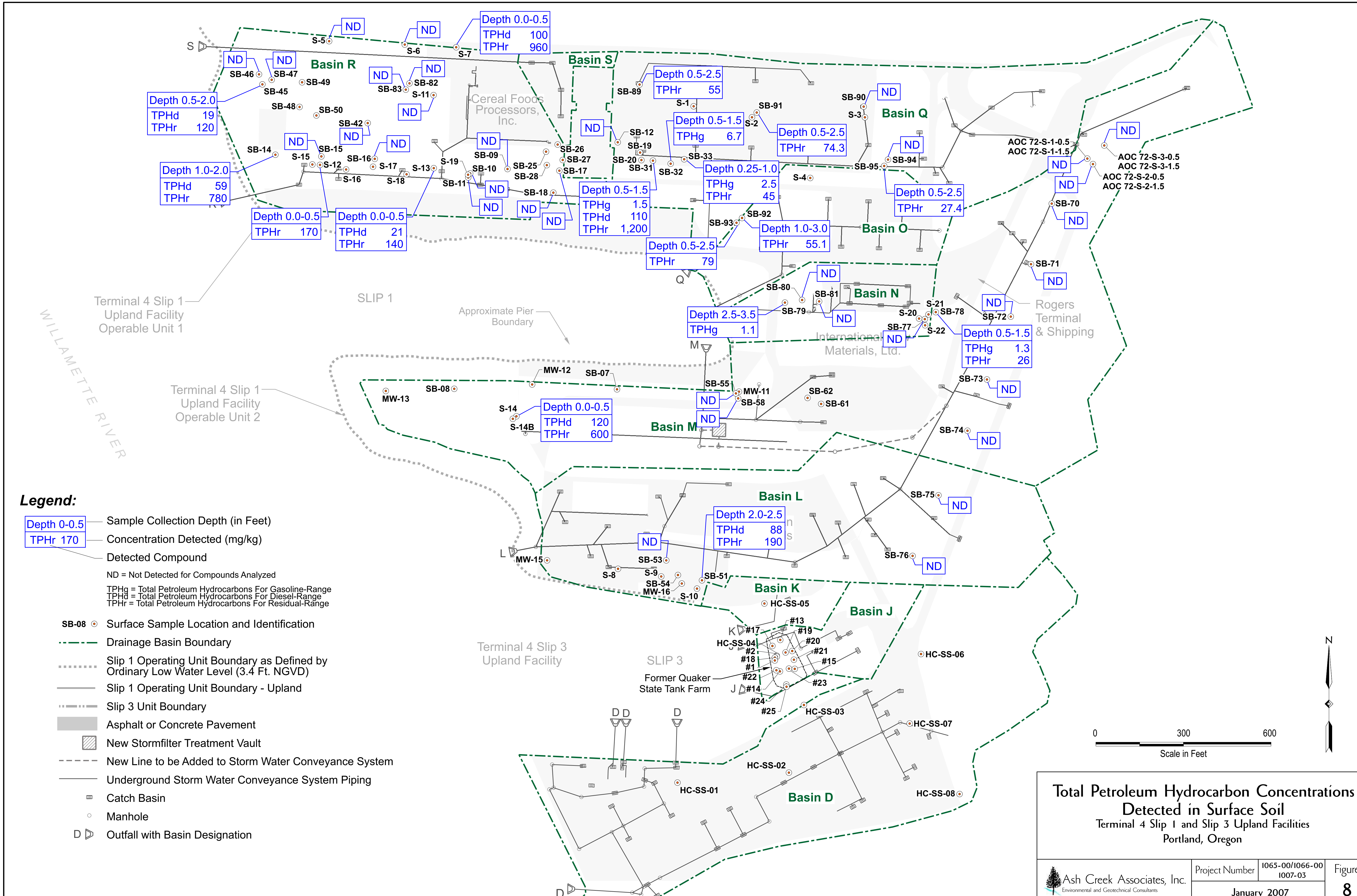
Semi-Volatile Organic Compounds Detected in Surface Soil
(Except Polynuclear Aromatic Hydrocarbons)
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

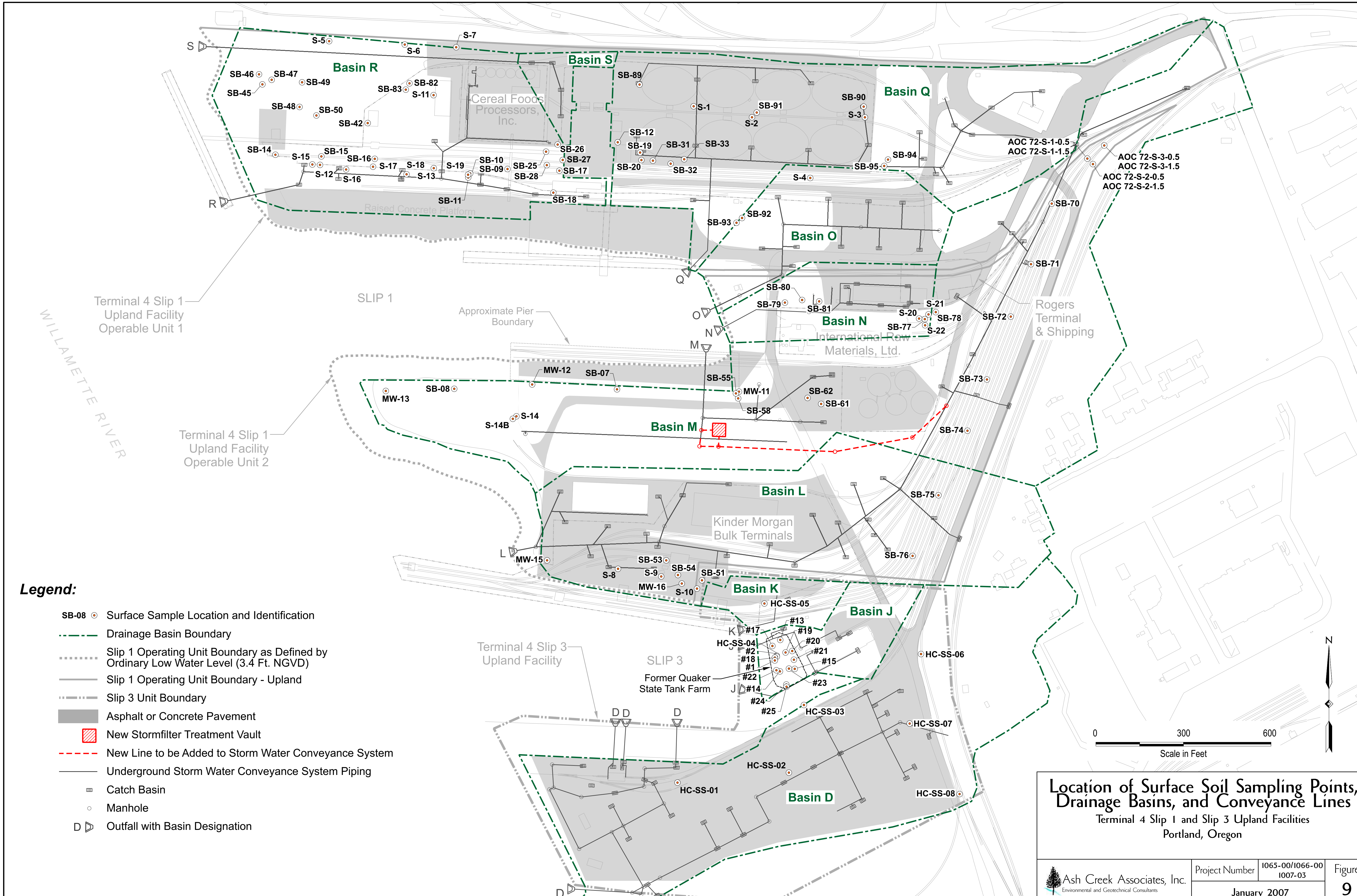
Project Number 1065-00/1066-00 1007-03

January 2007

Figure 7

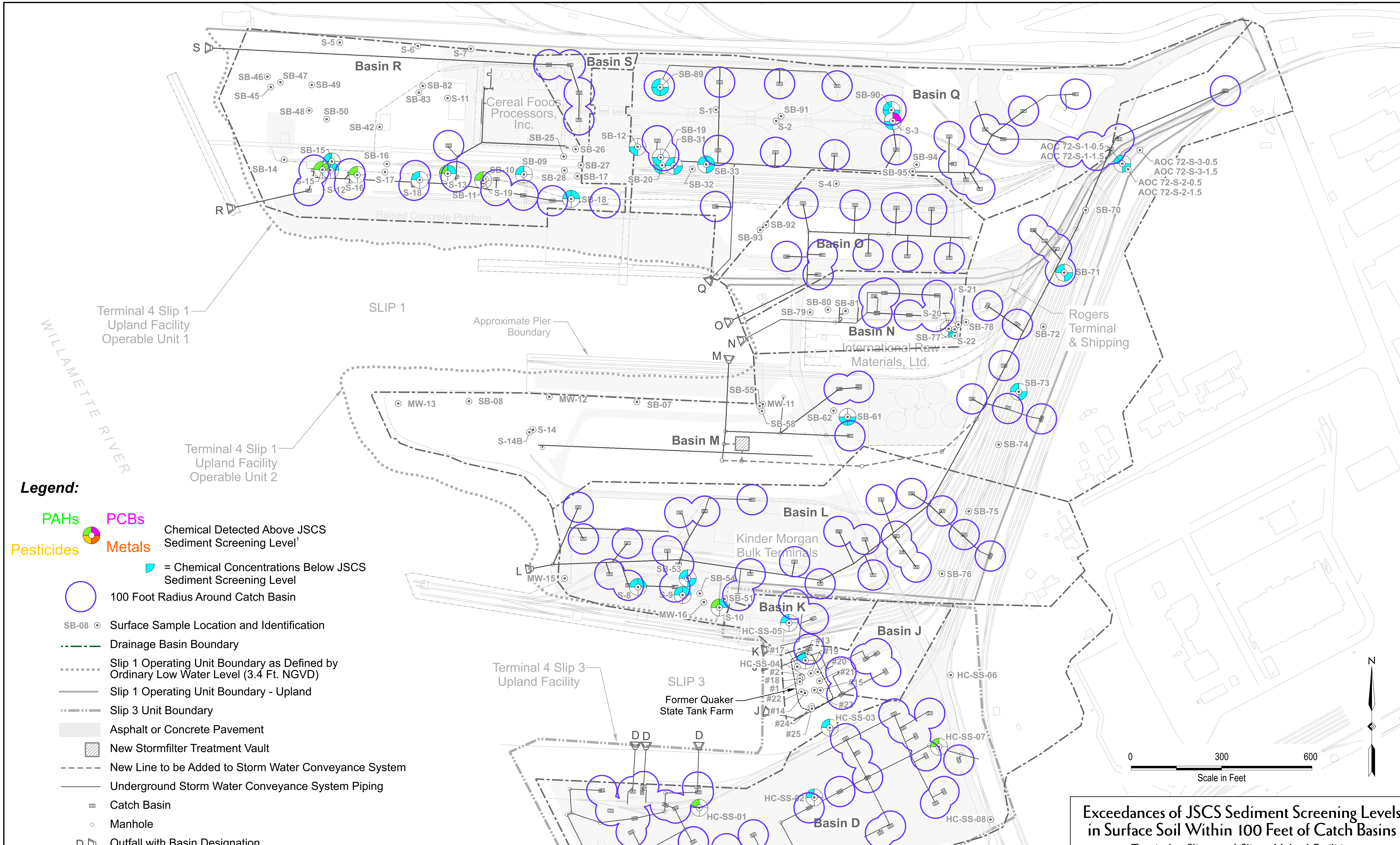


Basin R
Basin S
Basin Q
Basin O
Basin N
Basin M
Basin L
Basin K
Basin J
Basin D
Cereal Foods Processors, Inc.
Rogers Terminal & Shipping
International Materials, Ltd.
Terminal 4 Slip 1 Upland Facility Operable Unit 1
Terminal 4 Slip 1 Upland Facility Operable Unit 2
Terminal 4 Slip 3 Upland Facility
SLIP 1
SLIP 3
Approximate Pier Boundary
WILLAMETTE RIVER
Former Quaker State Tank Farm
Depth 0.0-0.5 TPHd 100 TPHr 960
Depth 0.5-2.0 TPHd 19 TPHr 120
Depth 1.0-2.0 TPHd 59 TPHr 780
Depth 0.0-0.5 TPHr 170
Depth 0.0-0.5 TPHd 21 TPHr 140
Depth 0.5-2.5 TPHr 55
Depth 0.5-1.5 TPHg 6.7
Depth 0.5-2.5 TPHr 74.3
Depth 0.25-1.0 TPHg 2.5 TPHr 45
Depth 0.5-1.5 TPHg 1.5 TPHd 110 TPHr 1,200
Depth 0.5-2.5 TPHr 79
Depth 1.0-3.0 TPHr 55.1
Depth 0.5-2.5 TPHr 27.4
Depth 2.5-3.5 TPHg 1.1
Depth 0.5-1.5 TPHg 1.3 TPHr 26
Depth 0.0-0.5 TPHd 120 TPHr 600
Depth 2.0-2.5 TPHd 88 TPHr 190
AOC 72-S-1-0.5
AOC 72-S-1-1.5
AOC 72-S-3-0.5
AOC 72-S-3-1.5
AOC 72-S-2-0.5
AOC 72-S-2-1.5
0 300 600
Scale in Feet
N
Legend:
Depth 0-0.5 — Sample Collection Depth (in Feet)
TPHr 170 — Concentration Detected (mg/kg)
Detected Compound
ND = Not Detected for Compounds Analyzed
TPHg = Total Petroleum Hydrocarbons For Gasoline-Range
TPHd = Total Petroleum Hydrocarbons For Diesel-Range
TPHr = Total Petroleum Hydrocarbons For Residual-Range
SB-08 Surface Sample Location and Identification
Drainage Basin Boundary
Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (3.4 Ft. NGVD)
Slip 1 Operating Unit Boundary - Upland
Slip 3 Unit Boundary
Asphalt or Concrete Pavement
New Stormfilter Treatment Vault
New Line to be Added to Storm Water Conveyance System
Underground Storm Water Conveyance System Piping
Catch Basin
Manhole
D Outfall with Basin Designation
Total Petroleum Hydrocarbon Concentrations Detected in Surface Soil
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon
Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants
Project Number 1065-00/1066-00 1007-03
January 2007
Figure 8



Location of Surface Soil Sampling Points, Drainage Basins, and Conveyance Lines
Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number	1065-00/1066-00 1007-03	Figure
	January 2007		9



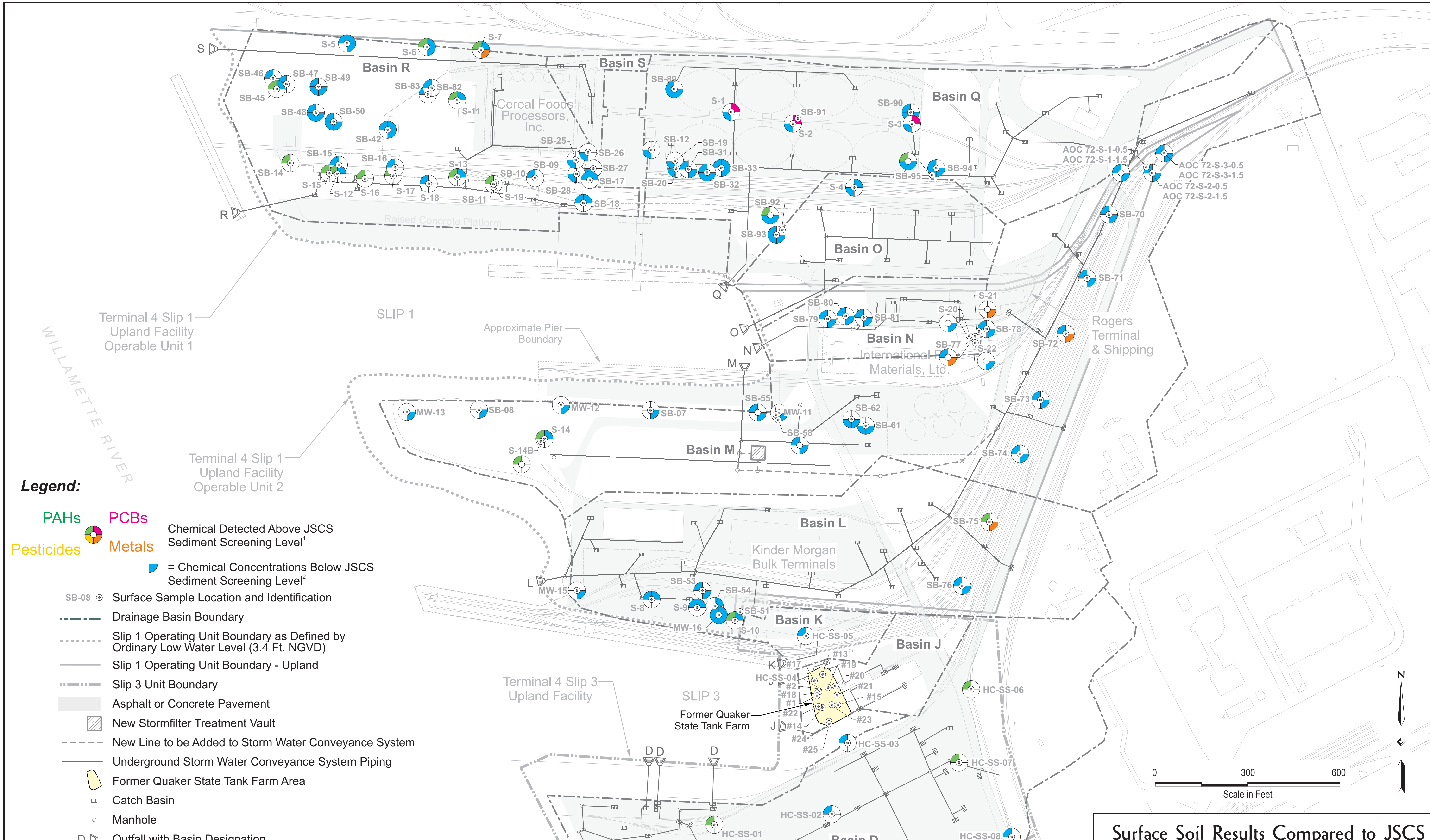
Notes:

1) Screening levels obtained From Table 3-1 of the DEQ Joint Source Control Strategy (JSCS) Document and include Probable Effects Concentrations (PECs) for toxicity and DEQ Screening Level Values (SLVs) for bioaccumulation.
2) Metals concentrations must also exceed regional background concentrations. Background Levels are from the Washington Department of Ecology's publication Natural Background Soil Metals Concentrations in Washington State, dated October 1994. Values are the 90th percentile values for Clark County, except for antimony, selenium, silver and thallium where state-wide data were used due to a limited number of detections.
3) Riverbank sample results not included on this figure.

Exceedances of JSCS Sediment Screening Levels in Surface Soil Within 100 Feet of Catch Basins

Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

Ash Creek Associates, Inc. Environmental and Geotechnical Consultants	Project Number	1065-00/1066-00 1007-03	Figure
	January 2007		10



Notes:

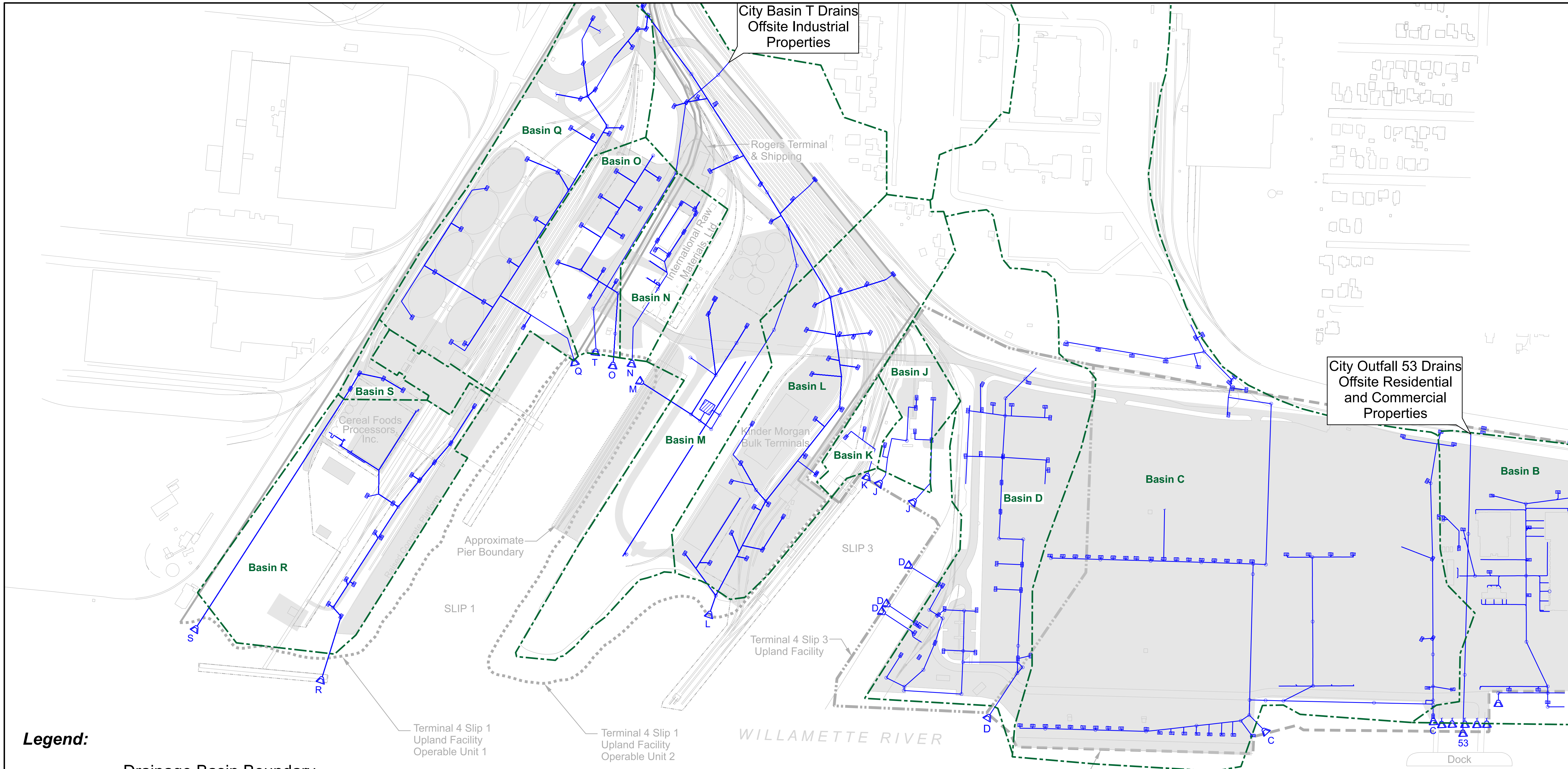
1) Screening levels obtained From Table 3-1 of the DEQ Joint Source Control Strategy (JSCS) Document.
2) Metals concentrations must also exceed regional background concentrations. Background Levels are from the Washington Department of Ecology's publication Natural Background Soil Metals Concentrations in Washington State, dated October 1994. Values are the 90th percentile values for Clark County, except for antimony, selenium, silver and thallium where state-wide data were used due to a limited number of detections.
3) Riverbank sample results not included on this figure.
4) One or more Polynuclear Aromatic Hydrocarbon (PAH) compounds were detected in surface soil at the Former Quaker State Tank Farm Area. The PAH concentrations at location HC-SS-04 were the highest detected in this area. Detected PAHs do not exceed JSCS screening levels at all locations within this area. Refer to table C-1 for a summary of the data.

Surface Soil Results Compared to JSCS Sediment Screening Levels

Terminal 4 Slip 1 and Slip 3 Upland Facilities
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1065-00/1066-00 1007-03	Figure
January 2007		11



Legend:

- Drainage Basin Boundary
- Slip 1 Operating Unit Boundary as Defined by Ordinary Low Water Level (1.7 Ft. CRD)
- Slip 1 Operating Unit Boundary - Upland
- Slip 3 Unit Boundary
- Terminal 4 Auto Storage Area
- Asphalt or Concrete Pavement
- Stormfilter Treatment Vault
- Underground Storm Water Conveyance System Piping
- Catch Basin
- Manhole
- D Outfall with Basin Designation

0 400 800
Scale in Feet

N

Notes: 1) Base map prepared from the URS Draft T4 Slip 1 RI Work Plan, dated May 2004.
2) Horizontal Datum: State Plane Coordinates, Oregon North, NAD 83. Vertical Datum: NVGD 29.
3) City outfall 52-C not shown.

Storm Drain System and Drainage Basins

Field Sampling and Procedures Report
Terminal 4 Upland Facility
Portland, Oregon

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Number	1267-05	Figure
	April 2008	3